



**US Army Corps
of Engineers®**

Wilmington District

FINDING OF NO SIGNIFICANT IMPACT

**WALTER SLOUGH NAVIGATION CHANNEL
(CHANNEL TO OREGON INLET FISHING CENTER)
DARE COUNTY, NORTH CAROLINA**

AUGUST 2002

FINDING OF NO SIGNIFICANT IMPACT

Walter Slough Navigation Channel (Channel to Oregon Inlet Fishing Center) Dare County, North Carolina August 2001

1.0 INTRODUCTION

The National Environmental Policy Act (NEPA) of 1969 requires consideration of the environmental impacts for major federal actions. The proposed action and the environmental impacts of the proposed action were addressed in the Section 107 Draft Detailed Project Report and Environmental Assessment, Walter Slough, Dare County, North Carolina, (DPR and EA) dated August 1999. The EA was circulated Federal, state, and local agencies and the public in October 1999. The U.S. Fish and Wildlife Service (USFWS) was an active participant in the feasibility study for the project. The USFWS submitted a planning aid document on the project and a summary report entitled USFWS Draft Fish and Wildlife Coordination Act Report for the Walter Slough Channel Project (dated September 1998).

As a result of comments made during the public comment period, the project plan has been changed from that presented in the EA. The changes principally involve the dredged material disposal aspects of the plan. The placement of dredged material on the beaches of the Cape Hatteras National Seashore is no longer a part of the project plan. This FONSI documents the project changes and the Corps of Engineers position that the proposed project will not significantly affect the quality of the human environment. This FONSI has been prepared pursuant to NEPA in accordance with the Council on Environmental Quality (CEQ) regulations as contained in 40 CFR Parts 1500 to 1508, which directs federal agencies on how to implement the provisions of NEPA.

Proposed Project - Walter Slough Navigation Channel

Walter Slough Channel extends from the Outer Banks of North Carolina southwesterly about 1.5 miles into Pamlico Sound. Two separate boat basins are located at the northeastern end of Walter Slough or the west side of Bodie Island. One basin contains a United States Coast Guard (USCG) station and a public boat ramp. The other basin is called the Oregon Inlet Fishing Center (OIFC). The OIFC is owned by the National Park Service and operated by a concessionaire. It is a major sport fishing facility that provides fuel, bait, ice, water, tackle, fish cleaning services, electricity, overnight docking, fish weighing, photography, and a marine toilet dump station. A restaurant, parking, boat launching, and a nearby campground are also available. Walter Slough Channel provides water access from the OIFC to maintained channels in Pamlico Sound. These interconnected channels provide access to Roanoke, Croatan, and Albemarle Sounds, as well as the Atlantic Ocean. The Walter Slough Navigation Channel Project is being

conducted under the authority of Section 107 of the Rivers and Harbors Act of 1960, as amended.

Channel Plan. The Walter Slough Navigation Channel Plan includes construction and maintenance of dimensions adequate to accommodate resident and transient vessels traveling to and from the OIFC. The proposed channel alignment shown on Figure 2 takes advantage of the existing path of deepest water to Pamlico Sound, appears to be the most direct and cost effective. The total length of a channel on this alignment is 7,900 feet. The channel dimensions are considered the minimum necessary for navigation on open water during periods of darkness and inclement weather. The proposed channel depth is 7 feet mhw plus two feet of overdepth. The proposed channel has a bottom width of 60 feet.

Dredged Material Disposal. Construction of the proposed channel would result in the disposal of 84,000 cubic yards of dredged material. Normal maintenance of this channel would result in the disposal of approximately 50,000 cubic yards of dredged material every 4 years. A total of 684,000 (84,000 initially plus 50,000 by 12 cycles) cubic yards of dredged material would be removed over the 50-year life of the project. Project construction and maintenance will be accomplished by hydraulic pipeline dredge. The current plan is to place dredged material on Island D. The placement of Walter Slough Channel dredged material on beaches of Cape Hatteras National Seashore or within the small, diked disposal adjacent to the Oregon Inlet Coast Guard Station has been deleted as a project feature.

Island D is the proposed dredged material disposal option. Island D, located just to the west of the confluence of Walter Slough and the Oregon Inlet Channel to Manteo, is the closest disposal island to Walter Slough large enough to handle the volume of material to be dredged. Disposal of dredged material would require pumping it to this island and placing the material using the control-of-effluent method of disposal to guide where sand accretion occurs. This technique has been used for previous Walter Slough dredging events as well as dredging within the Old House and Manteo to Oregon Inlet Channels. The control-of-effluent method of disposal involves pumping dredged material to the highest point on an unconfined disposal island and allowing it to naturally flow down the slopes of the island. The direction of effluent on the island would be to the channel side of the island (east side) to protect aquatic resources on the non-channel side (west side) (i.e. wetland fringes, submerged aquatic vegetation (SAV) and shallow water habitat). Control berms will be used, if necessary, to confine the solids and control the movement of sediment into the water.

The use of Island D as the sole dredged material disposal option is a significant change from the plan presented in the August 1999 Draft Feasibility Report and Environmental Assessment. The Feasibility Report and EA stated that Island D does not have sufficient capacity for the 50-year life of the project unless dredged material is removed on a regular basis. The current analysis is that Island D does have sufficient disposal capacity if a plan control of effluent methods, monitoring island topography changes, and

appropriate mitigation of aquatic resources is followed. Removal of dredged material from the island for other uses would also be pursued.

The placement of dredged material from future Walter Slough channel maintenance dredging events will physically change the island. The most noticeable change may be an increase in the size of the island. The increase in size of the island will depend to a large degree on the height to which the material is stacked. The higher the island is made, the less area will be taken up and the potential for adverse impacts on aquatic resources is reduced. However, island height adversely affects use of the island by colonial water birds. For the project area around Island D, the effluent will be controlled using berms towards the deeper water, the Manteo to Oregon Inlet Channel and east side of Island D. The goal of the disposal island management will be to provide dredged material disposal in balance waterbird use of the island and minimized changes in SAV habitat on the opposite or west side of the island. To accomplish this management plan, aerial photographs of the island will be digitized before and after each Walter Slough disposal event to determine basic changes the island and adjacent habitats directly attributable to the Walter Slough project. This information will be coordinated with the stakeholder agencies such as FWS, NMFS, NPS, NCDENR (Department of Environment and Natural Resources), and NCWRC (Wildlife Resources Commission). Appropriate mitigation will be implemented following agency coordination. The goal of the mitigation will be no net loss of SAV habitat attributable to the Walter Slough project. Some minor no net loss changes in size and shape of SAV habitat polygons attributable to natural fluctuations are acceptable.

Other disposal islands in the vicinity of Oregon Inlet, such as Island C, are farther from Walter Slough than Island D, and costs associated with pumping material would increase. Additionally, ownership of Island C and other islands such as E, F and G are in dispute. Private ownership is being claimed. Parnell and Wells Islands are not feasible alternative disposal sites. They are too distant from the Walter Slough dredging location. From the mid-point in the Walter Slough between the Oregon Inlet Fishing Center and the junction with Manteo to Oregon Inlet Channel, Wells Island is about 5 miles and Parnell Island is about 4 miles both to the southwest.

Dredged Material Characteristics. Sediment samples were taken in the Walter Slough Channel in April 1998. The results of this sampling are included in the DPR and EA. Additional channel sediment samples were taken in December 1999 and October 2000 in order to better characterize Walter Slough Channel sediments. The October 2000 samples were analyzed chemically to determine the potential for release of contaminants. The results of the December 1999 and October 2000 sampling and analyses are provided in Appendix A.

The sediment information provides a reasonable basis for determining that the sediments from Water Slough and the OIFC and USCG basins may be dredged and placed on Island D without producing unacceptable environmental effects including the release of contaminants. The December 1999 and October 2000 sediment data indicated the occurrence of fine-grained sediments not acceptable for beach placement.

Dredging History. In response to emergency request by various agencies and the public, Walter Slough was dredged in 1985, 1990, 1994, 1996, and 1999. In 1985, the USCG station was on Pea Island and an alternate location was needed for docking the USCG vessels due to shoaling at Pea Island. Accordingly, the station was relocated adjacent to the OIFC and Walter Slough Channel was dredged to 6 feet mlw, plus a foot of allowable overdepth, with a 50-foot bottom width. Island D and an upland diked area adjacent to the current USCG station were used as disposal areas. In 1990, following the temporary closing of the Bonner Bridge over Oregon Inlet, Walter Slough was deepened by the Wilmington District's sidecasting dredge Merritt so that the ferry vessels could be docked near the OIFC. Material was cast to the south side of the channel. In 1994, the USCG again contracted for dredging Walter Slough so that its vessels could operate. The channel was dredged to 9 feet mlw with a 60-foot bottom width. Approximately 50,000 cubic yards were dredged. Dredged material disposal in 1994 was on Island D. By 1996, a portion of the channel had shoaled again and the OIFC charter boats were faced with an emergency; they were essentially shoaled in by a couple of trouble spots. The channel was dredged on an emergency basis and the material placed in a diked disposal area adjacent to the USCG station. Finally, in 1999, as a result of pleas for help from the OIFC captains, Dare County, again with assistance from the State, dredged the Walter Slough Channel and placed the material Island D.

Construction Methods and Timing. The method of construction and maintenance will most likely be a 12-inch hydraulic pipeline dredge. Dredging will take place within the established dredging window for the area, currently 1 October through 31 March.

2.0 PUBLIC AND AGENCY COORDINATION

On October 12, 2000, the Section 107 Draft Detailed Project Report and Environmental Assessment, Walter Slough, Dare County, North Carolina dated August 1999, was mailed to Federal and State agencies and the interested public for a 30-day review and comment period. Recipients of the EA are listed in Appendix B of the EA. Comments on the EA were received from the following:

Federal Agencies

- US Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division and Habitat Conservation Division
- US Environmental Protection Agency, Region 4
- US Department of the Interior
 - Office of the Secretary, Office of the Environmental Policy and Compliance
 - National Parks Service, Outer Banks Group

State Agencies

- NC Department of Administration
- NC Department of Environment and Natural Resources

Division of Water Quality, Groundwater Section
Division of Marine Fisheries
Division of Coastal Management
Division of Environmental Health

Local Agencies

Elected Officials

Conservation Groups

Interested Businesses, Groups, and Individuals

- Dare County Oregon Inlet and Waterways Commission

A copy of the letters and correspondence received on the Section 107 Draft Detailed Project Report and Environmental Assessment for Walter Slough, Dare County North Carolina dated August 1999, is provided in Appendix B of this FONSI. The following sections summarize the comments made and provide the U. S. Army Corps of Engineers, Wilmington District response.

2.1 U.S. Department of the Interior

National Parks Service, Outer Banks Group (letter dated November 29, 1999)

Comment

The US Army Corps of Engineers (USACOE) has not developed this proposal in consultation with Cape Hatteras National Seashore as the document **has indicated** in several areas. Discussions about the proposed dredging of Walter **Slough** were begun with Mr. Daniel Small in the fall and winter of 1998, at Mr. Small's initiative. At that time, even though the project was not authorized or funded, Cape Hatteras National Seashore spent a great deal of time responding to the proposed future dredging of Walter Slough. Cape Hatteras National Seashore's position was presented in a letter to Mr. Ben Lane of the USACOE (Appendix E of the Environmental Assessment - Correspondence). That letter stated "we do not support the option of disposal on the beaches of Bodie Island." Furthermore additional concerns were expressed by Cape Hatteras National Seashore staff in a letter to Mr. Small (Appendix E of the Environmental Assessment - Correspondence). Discussions continued in January and February 1999 with Mr. Small in which Cape Hatteras National Seashore was clear in its position to not support beach disposal. Since those discussions, no contact has been made by the USACOE to develop the proposal under consideration concurrently with Cape Hatteras National Seashore. We were very surprised to be asked to review this document identifying beach disposal on National Park Service land as the preferred method for dredge spoil disposal considering our stated position. Our position remains that we do not support the disposal of Walter Slough Channel dredge spoil sediments on the beaches of Cape Hatteras National Seashore.

Response:

The proposed method of disposal for channel sediments is now control of effluent disposal to Island D. There will be no other disposal on DOI lands without prior consultation and coordination with affected agencies.

Comment:

This position is based on the following concerns:

1. Direct, cumulative, and potential impacts to beach organisms (mole crab, coquina clam, ghost crab) from deposition of dredge spoil disposal is not compatible with National Park Service and Cape Hatteras National Seashore policies and objectives. Derogation and destruction of National Park Service and Cape Hatteras National Seashore resources is in direct conflict with the National Park Service Organic Act of 1916, the Redwood Act as amended in 1978, and National Park Service Management Policies (1988).

Response:

See previous response.

Comment:

2. Impact to habitats and organisms, including submerged aquatic vegetation, salt marsh, and **upland dune systems** along the proposed pipeline route is not compatible with National Park Service and Cape Hatteras National Seashore policies and objectives.

Response:

See previous response.

Comment:

3. Dredge disposal sediments have not been adequately evaluated for compatibility with existing beach sediments at the proposed disposal site.

Response:

Proposed disposal site is Island D. Beach disposal is no longer a part of the proposed project.

Comment:

4. A contaminant analysis has not been conducted on material from the channel or basin sediments. All material that has the potential to affect Cape Hatteras National Seashore resources must be thoroughly analyzed before consideration can be given to permitting disposal of dredged material on any National Park Service lands, including upland disposal sites (see letter of April 16, 1999, from Superintendent Robert W. Reynolds).

Response:

Analysis of sediment samples was conducted in October 2000. This data is included in Appendix A of this FONSI. No contaminants that would preclude placement of dredged material on Island D were found.

Comment:

5. Direct, indirect, cumulative, and potential impacts that dredged material deposit may have on the nesting ability and hatching success of three species of threatened or endangered sea turtles that nest in the Cape Hatteras National Seashore have not been evaluated. Consultation with the US Fish and Wildlife Service ~~should~~ be initiated to determine these impacts.

Response:

Change in proposed disposal site removes any requirements for consultation with FWS in relation to potential impacts to nesting sea turtles. Should the possibility of the beach

disposal arise in the future, consultation and coordination with all relevant agencies would be initiated.

Comment:

6. The potential and cumulative impact this project may have on other related dredging and coastal projects in the area has not been discussed or evaluated. Although the USACOE states that the amount of material to be potentially disposed of on the beach is minimal and will not affect other operations in the area, Cape Hatteras National Seashore believes that potential cumulative impacts of this project and other related projects must be considered. Our concern is that beach disposal of dredged materials from this project may potentially be a significant impact to beach organisms and existing dredging operations in Oregon Inlet. The amount of material proposed to be dredged over the project life must take into consideration the proposed future replenishment of Dare County beaches. Our position is that these projects and their potential and cumulative impacts on resources and operations must be accounted for in considering the potential and cumulative impacts of this proposal.

Response:

The proposed method of disposal for channel sediments is now control of effluent disposal to Island D. Beach disposal on Cape Hatteras National Seashore has been removed from the proposed plan. Accordingly, a discussion of cumulative impacts on beach organisms is not required. There will be no other disposal on DOI lands without prior consultation and coordination with affected agencies.

Comment:

Cape Hatteras National Seashore has contacted North Carolina Wildlife Resources Commission (NCWRC) staff to investigate the feasibility of the USACOE using Island D or other islands in the vicinity of Walter Slough as dredge spoil deposit areas. Indications from NCWRC are that two islands, Parnell Island and Wells Island, in addition to Island D, are suitable dredge spoil deposit sites and in need of dredge spoil sediments. The NCWRC would like to use this material to enhance bird nesting areas on these islands. Cape Hatteras National Seashore encourages you to contact the NCWRC and evaluate the use of these islands as dredge material deposit areas.

Response:

Proposed dredged material disposal area is Island D. Parnell and Wells Islands are not feasible alternative disposal sites. They are too distant from the Walter Slough dredging location. From the mid-point in the Walter Slough between the Oregon Inlet Fishing Center and the junction with Manteo to Oregon Inlet Channel, Wells Island is about 5 miles and Parnell Island is about 4 miles both to the southwest.

The control of effluent methods are more favorable to waterbird usage than diked confinement methods.

Comment:

Cape Hatteras National Seashore requires that the USACOE provide a grain size and contaminant analysis for the material to be deposited in the upland site near the US Coast Guard Station. Additionally, any alteration of the size and elevation of the final upland

disposal site must be provided to my staff before approval can be given to use this site for disposal of Oregon Inlet Fishing Center basin or Walter Slough Channel dredged sediments.

Response:

The current project plan is to dispose of all dredged material on Island D. The upland dredged material disposal site near the US Coast Guard Station will not be used. Sediment sampling and analysis was conducted in October 2000 (See Appendix A). Contaminants that would preclude placement on Island D were not found.

Comment:

Cape Hatteras National Seashore encourages the USACOE to begin planning and development of alternative sites for disposal of dredged channel sediments for future projects. Other less environmentally damaging alternatives are possible and potentially resource enhancing uses of this material are available in the area.

Response:

The Wilmington District has conducted long-term dredged material management planning in the Walter Slough project area. These efforts include beneficial use options. This work has been conducted primarily in association with the Manteo (Shallowbag) Bay federal project. Two reports have been prepared, Dredged Material Management Plan, Preliminary Assessment, Manteo (Shallowbag) Bay, NC, April 1996 and Dredged Material Management Plan, (DMMP), Phase 1 Study, Manteo (Shallowbag) Bay Project, Dare County, NC, May 1998.

2.2 US Department of the Interior

Office of the Secretary, Office of Environmental Policy and Compliance (letter dated November 30, 1999)

Comment:

The Fish and Wildlife Service (FWS) does not concur with the determination that the proposed action would not likely adversely affect Federally-listed species or important aquatic habitat. Furthermore, there are outstanding concerns regarding cumulative impacts to fish and wildlife resources, primarily related to the numerous Federal projects proposed, scheduled, and/or ongoing in the Outer Banks ecosystem.

Response:

The proposed Walter Slough Project has been changed. Beach disposal of dredged material is no longer proposed. The method of disposal for channel sediments is now control of effluent disposal to Island D. Deposition of dredged material on NPS lands is no longer an alternative method for dredged material disposal. With these changes, the project impacts perceived by the FWS should be reduced. The Walter Slough project as proposed would not likely adversely affect Federally listed species or important aquatic habitats.

Comment:

The FWS has concerns about the impacts of the Walter Slough project in conjunction with other projects proposed, scheduled, and/or ongoing within the Outer Banks ecosystem. Specifically, there are concerns with the proposed channel deepening and

construction of jetties at Oregon Inlet to protect the navigation channel. The dredged material from the Walter Slough project, proposed for deposition on NPS lands updrift from Oregon Inlet, is fine to medium sand that will likely have a higher erosion rate than the existing sand. The FWS is not aware of an accounting of this additional sediment from the proposed Walter Slough project in the calculations for the Oregon Inlet project. As we are concerned with recent reductions in the budget for Federally maintained dredging projects, we feel this added sediment may present new challenges to maintaining safe and reliable navigation through Oregon Inlet. Without accurate sediment calculations, the navigation channel may experience additional shoaling not accounted for in the current environmental documentation for that project. This additional sediment may result in advanced maintenance operations or an immediate or crisis response to support navigation, potentially causing greater impacts to fish and wildlife resources.

Response:

The proposed method of disposal for channel sediments is now control of effluent disposal to Island D. Deposition of dredged material on NPS lands is no longer an alternative method for dredged material disposal. No additional shoaling of the navigation channel through Oregon Inlet is anticipated as a result of the Walter Slough project. There will be no dredged material disposal on DOI lands.

Comment:

In the past, similar Corps projects have been modified from the approved project operation plan because of limited funding or unexpected shoaling and obstructing in the navigable channel. This has led to advanced maintenance activities (i.e., increasing the depth and/or width of a channel to prevent shoaling and impairing navigation before the next scheduled maintenance dredging) or requests for excessive project expansions or modifications, resulting in additional impacts to fish and wildlife resources. The potential impacts of such Corps projects are not often adequately presented for review by the resource agencies, and the probable affects on fish and wildlife resources never accounted for (e.g., Oregon Inlet; Roanoke Sound, Manteo Harbor; Masonboro Inlet). We fear this may occur again with the proposed Walter Slough Channel project, and strongly suggest the Corps critically evaluate all projects within the Outer Banks ecosystem when assessing the cumulative impacts of this project. As a secondary impact, the sand proposed for deposition on NPS lands has the potential to cause problems at Oregon Inlet, and requires consideration in the EA under the National Environmental Protection Act (NEPA). Additionally it seems incongruous that a recommendation is made that this existing channel be federalized and become an additional federal responsibility for continued maintenance when budgets for maintenance projects are being reduced by Congress. We believe the maintenance of the channel should remain a county responsibility.

Response:

An analysis of the costs and benefits and environmental impacts of the proposed Walter Slough Project were presented in the Section 107, Draft Detailed Project Report and Environmental Assessment. These studies and analyses were conducted under the authority of Section 107 of the River and Harbor Act of 1960, as amended, and in accordance with the procedures prescribed in the Engineering Regulation (ER) 1105-2-100, *Guidelines for Conducting Civil Works Planning Studies*. These studies were

initiated in response to a letter request dated 20, February 1995 from the Dare County Board of Commissioners to investigate potential navigation improvements for Walter Slough. The conclusions of this analysis is that the project is economically feasibility and environmentally acceptable. The project features, costs and benefits, and environmental impacts are adequately described and discussed.

Section 107 of the River and Harbor Act of the 1960 authorizes the Corps of Engineers to conduct small boat navigation studies. We do not find it incongruous to make recommendations using the information available and current Department of the Army policies governing formulation of individual projects. The questions regarding national program and budgeting priorities have and will continue to be addressed through the processes of the Congress and the Executive Branch.

With regard to the specific comment dealing with the placement of sand on NPS lands and the causing of additional maintenance problems at Oregon Inlet, the beach placement of dredged material on the Cape Hatteras National Seashore is no longer proposed.

Comment:

The Corps has not developed this proposal in consultation with CHNS as the document has indicated in several areas. Discussions about the proposed dredging of Walter Slough were begun with Mr. Daniel Small in the fall and winter of 1998, at Mr. Small's initiative. At that time, even though the project was not authorized or funded, CHNS spent a great deal of time responding to the proposed future dredging of Walter Slough. The CHNS position was presented in a letter to Mr. Ben Lane of the Corps (Appendix E of the Environmental Assessment - Correspondence). That letter stated "we do not support the option of disposal on the beaches of Bodie Island." Furthermore additional concerns were expressed by Cape Hatteras National Seashore staff in a letter to Mr. Small (Appendix E of the Environmental Assessment - Correspondence). Discussions continued in January and February 1999 with Mr. Small in which CHNS was clear in its position to not support beach disposal. Since those discussions, no contact has been made by the Corps to develop the proposal under consideration concurrently with CHNS. We were very surprised to be asked to review this document identifying beach disposal on NPS land as the preferred method for dredge spoil disposal considering the previously stated position. The position remains that the NPS does not support the disposal of Walter Slough Channel dredge spoil sediments on the beaches of CHNS.

Response:

The communication between the Corps of Engineers and the NPS Outer Banks Group regarding the Walter Slough Project could and should have been better. The references to the NPS Outer Banks Group November 3, 1998 letter to Mr. Ben Lane are accurate. The NPS did not support the option of beach disposal on Bodie Island beaches. However, on December 10, 1998 another NPS Outer Banks Group letter was mailed to the Corps of Engineers indicating "Before we can agree to allow placement of dredge spoil on NPS property, the above issues must be resolved to our satisfaction, particularly with respect to the impact of dredging operations on the resources of the Cape Hatteras National Seashore. We will also need specific information on what locations the COE proposes to place dredge pipeline and dredge disposal, an analysis of dredge spoil and

beach sand compatibility, and a sediment contaminant analysis from the channel near the OIFC.” Further, in April 1999, a NPS Outer Banks Group letter was sent to Mr. Robert Sattin of the Corps of Engineers regarding the placement of dredged material on Cape Hatteras and Cape Lookout National Seashore properties. This letter outlined information requirements for special use permits for placement of dredged materials on Seashore properties. The December 1998 and April 1999 correspondence was interpreted to mean that the NPS’ policy was one of case by case review of beach placement of dredged material proposals rather than one of complete prohibition.

The proposed disposal of dredged material has been changed to Island D. Dredged material will not be placed on NPS beaches. The change in disposal plans was caused by two factors. One was the additional sampling of Walter Slough sediment in the December 1999 and October 2000. The sediment sampled contained too high a percentage of fines to be compatible on the beach. The second factor is that the required Special Use Permit is not supported by the NPS, therefore the beach disposal of dredged material on NPS properties is not a viable alternative.

Our assessment of impacts of beach placement of suitable dredged material on marine resources has not changed. The impact assessment of beach disposal of suitable dredged material was that impacts are expected to be minor and confined to the immediate vicinity of the disposal area and the timeframe in which the disposal occurs.

Comment:

Direct, cumulative, and potential impacts to beach organisms (mole crab, coquina clam, ghostcrab) from deposition of dredge spoil disposal is not compatible with NPS and CHNS policies and objectives. Derogation and destruction of NPS and CHNS resources is in direct conflict with the NPS Organic Act of 1916, the Redwood Act as amended in 1978, and NPS Management Policies (1988).

Response:

The proposed method of disposal for channel sediments is control of effluent disposal to Island D. There will be no dredged material disposal on DOI lands without prior consultation and coordination with affected agencies.

Comment:

Project impacts to habitats and organisms, including submerged aquatic vegetation, salt marsh, and upland dune systems along the proposed pipeline route is not compatible with NPS and CHNS policies and objectives.

Response:

See previous response. Proposed disposal area has been changed to Island D. No work within the NPS lands will occur.

Comment:

Dredge disposal sediments have not been adequately evaluated for compatibility with existing beach sediments at the proposed disposal site.

Response:

Beach disposal of dredged material has been deleted from the proposed project.

Additional sampling and analysis of channel and basin sediments was conducted in December 1999 and October 2000. These data are included in this FONSI. Contaminants of concern were not found at concentrations that would preclude the proposed dredging and dredged material disposal.

Comment:

A contaminant analysis has not been conducted on material from the channel or basin sediments. All material that has the potential to affect CHNS resources must be thoroughly analyzed before consideration can be given to permitting disposal of dredged material on any NPS lands, including upland disposal sites (see letter of April 16, 1999, from Superintendent Robert W. Reynolds).

Response:

Additional sampling and analysis of channel and basin sediments was conducted December 1999 and October 2000. No contaminants of concern were found at concentrations that would preclude the proposed placement on Island D.

Comment:

Direct, indirect, cumulative, and potential impacts that dredged material deposit may have on the nesting ability and hatching success of three species of threatened or endangered sea turtles that nest in the CHNS have not been evaluated. Consultation with FWS should be initiated to determine these impacts.

Response:

Change in proposed disposal site removes any potential impacts to nesting sea turtles and the requirement for consultation with FWS regarding nesting sea turtles. Should beach disposal be proposed in the future, consultation and coordination with all relevant agencies would be initiated.

Comment:

The potential and cumulative impact this project may have on other related dredging and coastal projects in the area has not been discussed or evaluated. Although the Corps states that the amount of material to be potentially disposed of on the beach is minimal and will not affect other operations in the area, CHNS believes that potential cumulative impacts of this project and other related projects must be considered. The concern is that beach disposal of dredged materials from this project may potentially be a significant impact to beach organisms and existing dredging operations in Oregon Inlet. The amount of material proposed to be dredged over the project life must take into consideration the proposed future replenishment of Dare County beaches. Our position is that these projects and their potential and cumulative impacts on resources and operations must be accounted for in considering the potential and cumulative impacts of this proposal.

Response:

The proposed method of disposal for channel sediments has been changed to control of effluent disposal on Island D. Beach disposal of dredge material and use of the upland site adjacent to the OIFC is no longer planned for the Walter Slough project. Therefore there will be no cumulative impacts with regard to the future replenishments of Dare County Beaches. There will be no dredged material disposal on DOI lands without prior consultation and coordination with affected agencies.

Comment:

CHNS staff has contacted North Carolina Wildlife Resources Commission (NCWRC) staff to investigate the feasibility of the Corps using Island D or other islands in the vicinity of Walter Slough as dredge spoil deposit areas. Indications from NCWRC are that two islands, Parnell Island and Wells Island, in addition to Island D, are suitable dredge spoil deposit sites and in need of dredge spoil sediments. The NCWRC would like to use this material to enhance bird nesting areas on these islands. CHNS encourages you to contact the NCWRC and evaluate the use of these islands as dredge material deposit areas.

Response:

Wells and Parnell Islands are too distant from the Walter Slough dredging area to be feasible disposal options. The proposed dredged material disposal area is now Island D. This would fall in line with the above comment. According to the Colonial Waterbird Nesting Database maintained by NWRC for the Corps of Engineers, Island D has had low waterbird utilization in recent years. Placement of additional material on Island D using control of effluent methods may provide conditions more favorable to waterbird use. Current use of Island D by waterbirds is very limited.

Comment:

CHNS requires the Corps provide a grain size and contaminant analysis for the material to be deposited in the upland site near the US Coast Guard Station. Additionally, any alteration of the size and elevation of the final upland disposal site must be provided to CHNS before approval can be given to use this site for disposal of Oregon Inlet Fishing Center basin or Walter Slough Channel dredged sediments. CHNS must issue a Special Use Permit before any project activity can occur on NPS land.

Response:

Additional sediment sampling and analysis was conducted in December 1999 and October 2000. These data are included in this FONSI. The proposed dredged material disposal area is now Island D. The upland diked site adjacent to the Oregon Inlet Coast Guard Station will not be used. There will be no disposal on DOI lands without prior consultation and coordination with affected agencies.

Comment:

CHNS encourages the Corps to begin planning and development of alternative sites for disposal of dredged channel sediments for future projects. Other less environmentally damaging alternatives are possible and potentially resource enhancing uses of this material are available in the area.

Response:

We consider the placement of compatible dredged material within the active beach and littoral system to be an environmentally acceptable alternative. The Section 107 Draft Detailed Project Report and Environmental Assessment discusses dredged material disposal options for the Walter Slough Project.

Walter Slough channel sediments are proposed for disposal on Island D. Other dredged material disposal alternatives are not available in this area. The Corps of Engineers will continue to look for ways to use dredged material beneficially within its authorization limits.

Comment:

Sections 6.8, 6.9, and 7.6 of the EA consider potential project impacts on Federally-listed species. The EA concludes the proposed project is not likely to affect the roseate tern (*Sterna dougallii*), bald eagle (*Haliaeetus leucocephalus*), seabeach amaranth (*Amaranthus pumilus*), West Indian manatee (*Trichechus manatus*), American alligator (*Alligator mississippiensis*), and piping plover (*Charadrius melodus*). Based on the available information, the FWS concurs that the proposed project is not likely to adversely affect the above mentioned species. The EA also concludes the proposed project is not, likely to affect the five resident species of sea turtles; green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*), loggerhead (*Caretta caretta*), hawksbill (*Eretmochelys imbricata*), and leatherback (*Dermochelys coriacea*). The FWS is responsible for sea turtles on the beach, whereas, the National Marine Fisheries Service (NMFS) is responsible for these same animals when they are in the water. All five species occur within the waters of North Carolina, however, only the green and loggerhead sea turtles are known to nest on the beaches within the proposed project area. Before the FWS can concur with the Corps' determination that the project is not likely to adversely affect the nesting activities of any green and loggerhead sea turtles, we strongly suggest the Corps address the following issue:

Compatibility analysis of dredged material and beach sand should be conducted before the placement of any dredged material on the beach. According to the EA, the dredged material proposed for beach disposal meets the > 90% sand criteria (pg. EA-6), but the compatibility of the beach sand and the dredged material has not been addressed. Deposition of dredged material not compatible with beach sand grain size, shape, and color can alter sea turtle behavior and augment sand compaction, resulting in an increase in the number of false crawls and aberrant nests, increased digging times for nesting females, unnatural sex ratios in hatchlings, and altering hatching success.

We suggest the Corps conduct compatibility analysis of dredged material and beach sand. If the results indicate compatibility of the materials, the FWS could then concur with the determination that the proposed project is not likely to adversely impact sea turtles.

Response:

Additional channel sediment sampling and analysis was conducted in December 1999 and October 2000. The December 1999 data was geotechnical information collected to supplement the beach compatibility assessment presented in the EA. The October 2000 data consists of physical and chemical analyses of the channel sediments. The additional sampling data indicates sediments with amounts of silt and clay not acceptable for beach placement.

The change in proposed disposal site of channel sediments to Island D removes the need for compatibility analysis in relation to concerns for nesting sea turtles. Should the possibility of beach disposal arise in the future, consultation and coordination with all relevant agencies would be required.

Comment:

Sections 6.5 and 7.3 of the EA consider potential project impacts on important Submerged Aquatic Vegetation (SAV) beds. The EA concludes the proposed project is not likely to affect SAV habitat, stating "the width of the navigation channel will be designed so as to avoid significant beds of SAV's (pg. EA- 12). However, in the response to the FWS Draft Coordination Act Report, the Corps states "the channel alignment will avoid SAV's, to the maximum extent practicable" and "either the channel alignment will be adjusted to avoid the SAV's or a mitigation plan which results in no net loss of SAV's will be developed and implemented" (pg. 1). The Corps continues in a response to the placement of the hydraulic pipeline with "the pipeline route from the dredge will be placed so as to avoid crossing known SAV's" (pg. 2). Based on the available information, the FWS does not concur that the proposed project is not likely to adversely affect important SAV beds. Before the FWS can concur with the Corps' determination, we strongly suggest the Corps address the following issue:

An up-to-date survey for SAV habitat within the proposed action area should be conducted and a mitigation plan developed for the potential impacts to SAV beds prior to the start of proposed activities. According to the EA, the Corps will develop and implement a compensatory mitigation plan should SAV beds be impacted (pg. EA-17), but the specifics of the mitigation plan are not included. In addition, the Corps makes no mention of the need for future surveys for SAV habitat in proximity of the proposed action. SAV habitat is extremely important for the production of fishery resources, providing a refuge from predators and a nursery area for juveniles of a variety of species. The elimination of a mitigation plan from the EA increases the likelihood of inadequate mitigation design and increases additional review time for necessary mitigation information. Furthermore, insufficient or out-dated data can result in excessive and unnecessary impacts to SAV habitat.

We suggest the Corps include an overview of the in-kind compensatory mitigation plan for potential impacts to SAV beds, including specific mitigation sites, and conduct a survey for the presence of SAV beds just prior to the onset of the proposed action. If included in the biological documentation, the FWS could concur with the determination that the proposed project would not likely adversely affect or result in the net loss of important SAV habitat.

Response:

The EA indicates that the proposed project is not likely to affect SAV habitat. Walter Slough was dredged in 1985, 1990, 1994, 1996, and 1999. The proposed channel alignment will follow the existing channel. As a result, additional impacts to seagrasses are not expected to occur and development of an in-kind mitigation plan for the channel dredging area is not warranted. NMFS conducted a SAV assessment of the Walter Slough project area using aerial photographs from 1990 through 1997. This work began in 1990 following emergency sidecast dredging of Walter Slough. In 1992 NMFS reported that all but one of the SAV habitat polygons in the vicinity of Walter Slough were virtually unchanged from before and after dredging. Some changes in size and shape of SAV areas were apparent and attributed to natural fluctuations (NMFS letter memorandum dated September 10, 1992). The 1994 NMFS letter memorandum dated

September 20, 1994 reported that the total area of seagrass habitat north of the Oregon Inlet Channel for 1990, 1991, and 1992 was 1772, 1624 and 2269 acres respectively. Subsequent NMFS letter memoranda (August 1995, and September 1997) reported similar findings but with some changes to specific habitat areas or polygons that NMFS attributed to dredging activities.

With regard to the project area around Island D, the effluent will be controlled using berms towards the deeper water, Manteo to Oregon Inlet Channel side of Island D. This should allow continued waterbird use of the island and minimize changes in SAV habitat extensive on the opposite or west side of the island. However, changes in the island topography are possible. Aerial photographs of the Island will be digitized before and after each Walter Slough disposal event to determine basic changes the Island and adjacent habitats directly attributable to the Walter Slough project. This information will be coordinated with the FWS, NMFS, NPS, NCDENR (Department of Environment and Natural Resources), and NCWRC (Wildlife Resources Commission). Appropriate mitigation will be implemented following agency coordination. The goal of the mitigation will be no net loss of SAV habitat attributable to the Walter Slough project. Some minor changes in size and shape of SAV habitat polygons attributable to natural fluctuations are acceptable.

Comment:

The current proposal for dredging of Walter Slough has not been developed in consultation with CHNS. A Special Use Permit (SUP) must be issued by CHNS before any project activity can occur on NPS land.

Response:

The current proposal for dredging and disposal of dredged materials on Island D will be coordinated and with the CHNS and application for a Special Use Permit made if required.

Comment:

We believe the Corps has not adequately addressed the issues in their determination that the proposed action is not likely to adversely affect Federally-listed species and important SAV habitat. We recommend the preceding issues be fully addressed in the environmental documentation. In addition, we believe that the proposed Walter Slough dredging and disposal operation cannot be accomplished without significant impacts to fish and wildlife resources when considered in conjunction with the numerous Federal projects, ongoing and/or proposed, within the Outer Banks ecosystem. We suggest the Corps thoroughly evaluate ongoing, scheduled, and proposed projects for associated indirect impacts, and develop a contingency plan for the potential cumulative impacts resulting from multiple projects within the barrier island ecosystem. Some consideration of the federalization of this channel maintenance and the cumulative and indirect impacts of all continuing maintenance projects should be discussed in relationship to adoption of this plan. We are concerned that the recommendation to add another project did not consider the cumulative and related impacts to other existing federal projects. These issues should be completely and adequately discussed in the environmental documentation.

Response:

The Feasibility Report and EA adequately describes the environmental impacts associated with the Walter Slough Navigation Project. The impacts to Federally-listed species and SAVs are considered. Cumulative impacts were considered. A navigation channel at Walter Slough has been in-place for some time. The significant impacts to the fish and wildlife resources within the Outer Banks ecosystem implied in the above comment and attributable to the Walter Slough Navigation Project are not evident.

The EA describes Island D as an alternative to placement of dredged material on CHNS beaches. As a result of the NPS opposition to beach placement of dredged material on NPS properties, the beach placement has been replaced with Island D control of effluent methods.

Comment:

At this time, due to insufficient data on the project impacts on Federally-listed species, and the potential impacts to important SAV habitat, the FWS would not concur with a Finding of No Significant Impact (FONSI) for the proposed action. For those species in which the FWS concurs that the proposed project is not likely to adversely affect, we remind you that obligations under Section 7 consultation must be reconsidered if (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; (3) a new species is listed or critical habitat determined that may be affected by the identified action.

Response:

Regarding the impact assessment for Federally-listed species and SAVs, see the previous comment/response.

We understand that a change in the project may result in a need for reconsideration of Section 7 consultation requirements.

2.3 United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division (letter dated November 8, 1999)

Comment:

The National Marine Fisheries Service (NMFS) has previously determined that use of a pipeline dredge is unlikely to adversely affect federally listed species under NMFS purview. Thus, use of a pipeline dredge would not require further consultation under section 7 of the ESA. In addition, NMFS has previously consulted (April 1999) with the COE Wilmington District on the use of small (CURRITUCK size-class) hopper dredges and small side cast dredges (FRY, MERRITT and SCHWETIZER) to dredge Eastern Seaboard coastal channel and inlets. NMFS concluded that these smaller dredges are unlikely to adversely affect listed species. Nevertheless, NMFS strongly recommends that the construction period be limited to the winter months as planned when abundance of Federally-listed sea turtle species is lowest.

Response:

The work will be conducted between October 1 and March 31. A pipeline dredge is the proposed dredging method.

Comment:

NMFS foresees potential adverse effects to endangered and threatened species under NMFS purview if a large commercial-type hopper dredge is used. These dredges are known to lethally take sea turtles and sturgeon. NMFS has previously consulted with the Corps of Engineers, South Atlantic District on the effects of using hopper dredges to dredge East Coast channels and offshore borrow areas (August 25, 1995; April 9, 1997; September 25, 1997). Because of the potential for adverse effects to listed species from hopper dredges, NMFS incorporated reasonable and prudent measures, terms and conditions, and conservation recommendations into the preceding biological opinions. If COE Wilmington District intends using a hopper dredge (other than the exempted size class noted above) to conduct the described dredging activity, similar terms and conditions would be required to prevent/minimize adverse effects to sea turtles.

Response:

A large commercial hopper dredge will not be used for the proposed Walter Slough dredging.

2.4 United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, Habitat Conservation Division (letter dated November 9, 1999)

Comment:

The DPR and EA describe the fishery resources found in the project area and the work's potential impacts on these resources. However, it should be noted that the project area supports essential fish habitat (EFH) for postlarval and juvenile red drum, white shrimp, brown shrimp, and other important fisheries. Categories of EFH common in coastal North Carolina include estuarine emergent wetlands, sand and mud substrates, estuarine water column, and submerged aquatic vegetation. Detailed information on red drum, shrimp, and other Federally managed fisheries and their EFH is provided in the 1998 amendments of the Fishery Management Plans prepared by the South Atlantic and the Mid-Atlantic Fishery Management Councils. The 1998 EFH amendments were prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 104-297).

Response:

Additional information regarding impacts on EFH have been prepared and included as appendix C.

Comment:

We have also reviewed the September 1998 Draft Fish and Wildlife Coordination Act Report included with the document and concur with and support the recommendations found on pages 41 – 44.

Response:

Noted. A response to each of these recommendations is included in the EA. However, as a result of project coordination, several project features have changed and the

recommendation or the response may not be applicable. For example, the use of the CHNS beaches for dredged material disposal is no longer a project component. Recommendations 6 and 8 involve actions associated with the no longer proposed beach placement of dredged material.

2.5 US Environmental Protection Agency, Region 4 (letter dated October 28, 1999)

Comment:

Pursuant to Section 309 of the Clean Air Act, EPA, Region 4 has reviewed the subject document, an evaluation of the environmental consequences of constructing channel upgrades along a 1.5 mile reach of Pamlico Sound from Bodie Island to Oregon Inlet Channel to Manteo. The material removed will be deposited in various locations, e.g., the ocean shoreline of Cape Hatteras National Seashore, Walter Island (Island D), or a diked disposal area near the U.S. Coast Guard Station, depending on the percentage of fines encountered. **Both the initial construction and subsequent maintenance work will use a hydraulic pipeline (84,000 and 50,000 cubic yards, respectively).** While dredging always has some adverse water quality impacts, in this instance if the stipulations noted in the U.S. Fish and Wildlife Coordination Report are maintained they do not appear to be unacceptable in terms of duration and/or severity. Therefore, on the basis of the information provided in the EA we have no significant objections to its use as the evaluation model rather than the more comprehensive environmental impact statement format.

Response:

Noted.

2.5 North Carolina Department of Administration, Environmental Policy Act Coordinator (letter dated October 14, 1999)

Comment:

The N.C. State Clearinghouse has received the above referenced project (Navigation Improvements for Walter Slough in Dare County). This Project has been assigned State Application Number 00-E-0000-0190. Review of this project should be completed on or before 11/14/1999.

Response:

Noted.

2.6 North Carolina Department of Environment and Natural Resources, Division of Water Quality, SEPA Coordinator (memorandum dated November 10, 1999)

Comment:

The EA notes that "the location of known submerged grassbeds were mapped between 1990 and 1996." As SAV is capable of drastic expansion and contraction of establishment on a year-to-year basis, an additional SAV survey in the project area needs to be conducted to determine the present and potential impacts on SAV (both direct and indirect). This is especially important in regards to the undisturbed 30' buffer from the edge of the channel, to SAV beds adjacent to the channel.

Response:

Walter Slough was dredged in 1985, 1990, 1994, 1996, and 1999. In 1985 the USCG station was on Pea Island and an alternate location was needed for docking the USCG vessels due to shoaling at Pea Island. Accordingly, the Walter Slough Channel was dredged to 6 feet mlw, plus a foot of allowable overdepth, with a 50-foot bottom width. Island D and an upland diked area adjacent to the current USCG station were used as disposal areas. In 1990, Walter Slough was deepened by the Wilmington District's sidecasting dredge Merritt so that the ferry vessels could be docked near the OIFC. Material was cast to the south side of the channel. In 1994, the USCG contracted for dredging Walter Slough. The Coast Guard station had been relocated from Pea Island. Approximately 50,000 cubic yards were dredged. The channel was dredged to 9 feet mlw with a 60-foot bottom width. Dredged material disposal in 1994 was on Island D. By 1996, a portion of the channel had shoaled again and the OIFC charter boats were faced with an emergency; they were essentially shoaled in by a couple of trouble spots. The channel was dredged on an emergency basis and the material placed in a diked disposal area adjacent to the USCG station. Finally, in 1999, as a result of request for help from the OIFC captains, Dare County, again with assistance from the State, dredged the Walter Slough Channel and placed the material Island D. The proposed Federal channel alignment will follow the existing channel alignment. As a result, additional impacts to seagrasses are not expected to occur as a result of the proposed channel and development of an in-kind mitigation plan is not warranted.

With regard to the area around Island D, aerial photographs of the Island will be digitized before and after each Walter Slough disposal event to determine basic changes the Island and adjacent habitats directly attributable to the Walter Slough project. This information will be coordinated with the FWS, NMFS, NPS, NCDENR (NC Department of Environment and Natural Resources), and the NCWRC (NC Wildlife Resources Commission). Appropriate mitigation will be implemented following agency coordination. The goal of the mitigation will be no net loss of SAV habitat attributable to the Walter Slough project. Some minor changes in size and shape of SAV habitat polygons attributable to natural fluctuations are acceptable.

Comment:

The EA notes that a mitigation plan, which would result in no net loss of SAV, will be developed and implemented. Please elaborate on what this plan would be comprised of and how it would be implemented if its employment were necessary due to SAV impacts.

Response:

See the previous response. The principal elements of the plan to minimize impacts to SAVs is to dredge the proposed federal channel along the existing channel alignment, use control of effluent methods to direct accretion towards the east or channel side of the island, and monitor the changes in island topography.

Comment:

The EA extensively notes the organisms that may or may not be affected by the proposed project. However, there seemed to be no discussion regarding the presence or absence of shellfish resources within the project boundaries. Please provide this information in the amended EA. If significant shellfish resources are present, as defined by the NC Division

of Marine Fisheries (NCDMF), then these areas may need to be avoided or resources may need to be relocated to suitable habitat pre-approved by NCDMF.

Response:

Significant shellfish resources will not be affected by the proposed project. The Walter Slough Channel has been previously dredged. Oyster beds and oyster management areas in the project vicinity will not be affected by the proposed project.

Comment:

Please provide additional information regarding the length of beach that will receive spoil versus the length of adjacent beach that will not receive spoil. In general, please elaborate on the beach disposal plan.

Response:

Beach disposal on CHNS is no longer proposed. Disposal of channel sediments will be on Island D.

2.7 North Carolina Department of Environment and Natural Resources, Division of Environmental Health (memorandum dated November 17, 1999)

Comment:

Notify Shellfish Sanitation prior to dredging from a closed area with disposal to an open area. Beach disposal between the months of May and October would require warning signs to be posted.

Response:

Noted. Beach disposal on CHNS is no longer proposed. Disposal of channel sediments will be on Island D.

2.8 North Carolina Department of Environment and Natural Resources, Division of Coastal Management (checklist memorandum dated November 23, 1999)

The following Items were checked

Comment:

A Consistency Determination document is required for this project pursuant to federal law and or NC Executive Order 15.

Response:

Noted. The EA contains a Consistency Determination statement.

Comment:

Proposal is in draft form, a consistency response is inappropriate at this time. A Consistency Determination should be included in the final document.

Response:

Noted. This FONSI contains a Consistency Determination.

Comment:

Proposal is in draft form, a consistency response is inappropriate at this time. A Consistency Determination should be included in the final document.

Response:

Noted. This FONSI contains a Consistency Determination.

Comment:

Other.

Several items were attached to the checklist including:

- 1) Memorandum from NC Division of Coastal Management, Elizabeth City Office, dated November 15, 1999. These comments are included as Paragraph 2.9.
- 2) Letter from NC Division of Coastal Management dated October 29, 1998 to Mr. John Hefner USFWS.
- 3) Memorandum from NC Division of Marine Fisheries dated September 29, 1998. Subject – review of Draft U.S. Fish and Wildlife Service Coordination Act Report.
- 4) Memorandum from NC Division of Coastal Management, Elizabeth City Office, dated October 27, 1998. Subject - review of Draft U.S. Fish and Wildlife Service Coordination Act Report.

Response:

No responses to items 2, 3, and 4 above are provided. These were comments on the Draft USFWS Coordination Act Report. The issues discussed are included in other NC Division of Coastal Management comments. For Item 1, see Section 2.9, which follows.

2.9 North Carolina Department of Environment and Natural Resources, Division of Coastal Management, Elizabeth City Office (memorandum dated November 15, 1999)

Comment:

My initial review of the project, in October 1998, raised several questions (See Attached), most of which have been addressed. The current proposal appears to reduce the original project impacts, but does not: 1) commit to the recommended time for the work to be accomplished, and; 2) confined spoil on Island D above normal water level.

Response:

- 1) The dredging is scheduled to take place between 1 October and 31 March.
- 2) Island D is the proposed dredged material disposal area. Island D is located just to the west of the confluence of Walter Slough and the Oregon Inlet Channel to Manteo. Island D is the closest disposal island to Walter Slough. Disposal of dredged material would require pumping it to this island and placing the material using the control-of-effluent method of disposal to guide where sand accretion occurs. This technique has been used for previous Walter Slough dredging events and on other disposal islands in the area. The control-of-effluent method of disposal involves pumping dredged material to the highest point on an unconfined disposal island and allowing it to naturally flow down the slopes of the island. The direction of effluent on the island would be to the channel side of the island (east side) to protect aquatic resources on the non-channel side (west side) (i.e. wetland fringes, submerged aquatic vegetation (SAV) and shallow water habitat). Control berms will be used as necessary to confined dredged material and control the movement of sediment into the water.

The placement of dredged material from future Walter Slough channel maintenance dredging events will physically change the island. The most noticeable change may be an increase in the size of the island. The increase in size of the island will depend to a large degree on the height to which the material is stacked. The higher the island is made the less area will be taken up and the potential for adverse impacts on aquatic resources is reduced. However, island height adversely affects use of the island by colonial waterbirds. On Island D, the effluent will be controlled using berms towards the deeper water, the Manteo to Oregon Inlet Channel and east side of the island. The goal of the disposal island management will be to provide dredged material disposal in a manner that allows waterbird use of the island and minimizes changes in SAV habitat on the opposite or west side of the island. To accomplish this management plan, aerial photographs of the Island will be digitized before and after each Walter Slough disposal event to determine basic changes the Island and adjacent habitats directly attributable to the Walter Slough project. This information will be coordinated with stakeholder agencies such as FWS, NMFS, NPS, NCDENR (Department of Environment and Natural Resources), and NCWRC (Wildlife Resources Commission). Appropriate mitigation will be implemented as necessary following agency coordination. The goal of the mitigation will be no net loss of SAV habitat attributable to the Walter Slough project. Some minor no net loss changes in size and shape of SAV habitat polygons attributable to natural fluctuations are acceptable.

Comment:

While the Division strongly supports implementation of the U. S. Fish and Wildlife Service recommendations, submitted as a part of the overall document and found on pages 41 and 43 of the Environmental Assessment, I would like to offer the following:

- 1) Dredge spoil placed on existing the spoil island (Island D) should be confined landward of normal water level to prevent entry of sediments into the sound.
- 2) Dredging should occur between February 1st and October 31st.
- 3) Should spoil from the project be found compatible for placement on the beach, it should occur between November 15th and May 1st (outside of the established moratorium for nesting sea turtles).
- 4) The entire 1.5 mile channel between the OIFC and Old House Channel should be limited to a bottom with not to exceed 60' and a depth of 8' at mean low water.

Response:

- 1) See previous response. The past practice is to place dredged material on Island D using control of effluent methods. This method guides where sand accretion occurs. The effluent is directed toward the channel side of the Island. This method will be used where possible. Where needed, temporary berms will be used to control material and prevent the entry of sediments into the sound.
- 2) Dredging will be planned for the October 1 through March 31 period.

- 3) Beach disposal on CHNS has been deleted as a project proposal.
- 4) The proposed Walter Slough Channel is 7 feet mlw and a bottom width of 60 feet. Two feet of allowable overdepth will be added for dredging inaccuracies.

2.10 North Carolina Department of Environment and Natural Resources. Division of Water Quality, Groundwater Section (memorandum dated November 8, 1999)

Comment:

As a result of this project, any chemical or petroleum spills that occur of significant quantity must be reported to the Division of Water Quality in the Washington Regional Office (252-946-6481).

Response:

Noted. The dredging contract specifications contain provisions to comply with spill prevention and notification requirements as well as other environmental requirements.

Comment:

Prior to commencing dredging in the Oregon Inlet Fishing Center (OIFC) sediment samples should be collected from the marina area and analyzed for potential contaminants generally associated with boat operations and maintenance (petroleum & heavy metals).

Response:

Sediment sampling and analysis was conducted in October 2000. This data is included in this FONSI. No contaminants of which would preclude the proposed plan were found.

2.11 Dare County, Oregon Inlet and Waterways Commission (letter dated November 14, 1999)

Comment:

Walter Slough is very important to the people of eastern North Carolina. It serves as an important link between the Oregon Inlet Fishing Center and Oregon Inlet Coast Guard Station with other federally maintained channels in the Pamlico, Croatan, and Roanoke Sounds. If Walter Slough becomes impassable, the charter fleet that operates out of the Oregon Inlet Fishing Center will be trapped in the Fishing Center basin, unable to operate. In addition the Coast Guard will not be able to perform its search and rescue duties in the area in a timely fashion.

Response:

Noted.

Comment:

In the Project Report and Environmental Assessment just released, the Corps of Engineers explains its plans to deepen Walter Slough to a depth of 7 feet and a width of 60 feet in hope of ensuring proper navigation through the waterway. A four-year cycle of maintenance is also proposed. On behalf of the people of Dare County, we support the inclusion of Walter Slough to the regular maintenance schedule. A channel 7 feet deep

(with two feet of overdepth) should allow navigation by area vessels. Sixty feet should be wide enough to allow passing by members of the fleet.

Response:

Noted.

Comment:

The major concern of my people with the proposal is the 4 year timetable chosen for maintenance. Walter Slough has a history of shoaling problems that tend to occur every couple of years. A 4-year maintenance cycle may not allow dredging as often as needed. Therefore, we would respectfully request dredging be done on a two year cycle. At the very least, the Corps needs to be ready to do emergency dredging when and if the channel becomes too shallow in the years when no regular maintenance dredging is scheduled.

Response:

The 4-year cycle identified in the Project Report and Environmental Assessment is the Corps of Engineer's best estimate of the required maintenance for the recommended 7-foot depth. The estimated 4-year maintenance interval was derived using the historic shoaling rates and project features to deal with troublesome areas. After construction, shoaling will be monitored with periodic surveys and the maintenance interval will be adjusted as required. If a storm or a new shoaling pattern causes problems before the scheduled maintenance, Walter Slough would be considered for emergency dredging. This dredging would need to be performed within the existing dredging windows, which is October 1 through March 31.

3.0 ENVIRONMENTAL REQUIREMENTS

3.1 NC Coastal Management Program

The Coastal Zone Management Act (CZMA) of 1972, as amended (PL 92-583) requires that Federal activities be consistent, to the maximum extent practicable, with the approved State coastal management programs. The local land-use plan for the project area is the Dare County, North Carolina, Land Use Plan, latest update 1994. Navigation channels are defined as a second priority use of estuarine and public trust waters and are consistent with the management objectives. Some temporary disruption of seagrass beds may result from the project. Dredging specifications are being designed so as to minimize adverse impacts and not be detrimental to the long-term biological and physical functions of the estuary. Estuarine shorelines will not be affected by the proposed action.

The proposed channel is a minimized channel. The U.S. Army Corps of Engineers guidelines (EM 1110-2-1615, Hydraulic Design of Small Boat Harbors) indicates that a width of 105 feet and a depth of 8.5 feet would be desirable, based on the design vessel (18.5 foot beam and a 4.5 foot draft). However, boaters have successfully used a narrower channel with less depth. Accordingly the existing 60-foot by 7-foot channel was selected.

Island D is the proposed dredged material disposal option. Island **D**, located just to the west of the confluence of Walter Slough and the Oregon Inlet Channel to Manteo, is the closest disposal island to Walter Slough. Disposal of dredged material would require pumping it to this island and placing the material using the control-of-effluent method of disposal to guide where sand accretion occurs. This technique has been used for previous Walter Slough dredging events as well as dredging within the Old House and Manteo to Oregon Inlet Channels. The control-of-effluent method of disposal involves pumping dredged material to the highest point on an unconfined disposal island and allowing it to naturally flow down the slopes of the island. The direction of effluent on the island would be to the channel side of the island (east side) to protect aquatic resources on the non-channel side (west side) (i.e. wetland fringes, submerged aquatic vegetation (SAV) and shallow water habitat). Control berms will be used, if necessary, to confine the solids and control the movement of sediment into the water.

NC Administrative Code (NCAC) 7H .0208 (b)(2)(B) requires that all dredged material be placed on high ground by adequate retaining structures or if the material is suitable, deposited on the beaches for purposes of renourishment. NCAC 7H .0208 (b)(2)(G) provides that publicly-funded projects will be considered on a case by case basis with respect to dredging methods and dredged material disposal. All reasonable means and measures to protect estuarine water and public trust area resources and mitigate adverse impacts of the discharges have been incorporated with respect to implementation of dredging and dredged material disposal.

Therefore, based on the above findings, the project is considered to be consistent to the maximum extent practicable with the North Carolina Coastal Management Program. State concurrence with this determination will be requested from The North Carolina Division of Coastal Management.

3.2 Essential Fish Habitat

The 1996 Congressional amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (PL 94-265) set forth new requirements for the National Marine Fisheries Service (NMFS), Regional Fishery Management Councils (FMCs), and other Federal agencies to identify and protect important marine and anadromous fish habitat. Potential project impacts on Essential Fish Habitat (EFH) species and their habitats have been evaluated (Appendix C). Compliance obligations related to the MSFCMA would be fulfilled prior to initiation of the proposed action. The impact summary for EFH is that the proposed action is not expected to cause any significant adverse impacts to EHF or EFH species.

4.0 ENVIRONMENTAL COMMITMENTS

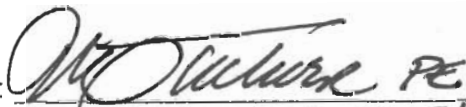

The environmental goal of this project is to avoid and minimize adverse impacts to the extent practicable. Construction and maintenance activities will be conducted as described in the August 1999 EA and this FONSI. This section describes environmental commitments that have been made to minimize environmental impacts.

- Channel Plan. The Walter Slough Channel will be 7 feet mlw plus 2 feet of allowable overdepth. The channel will be 60 feet wide (bottom width). The proposed channel will follow the existing channel alignment to the maximum extent practical.
- The dredging will take place between October 1 and March 31.
- Dredged material disposal will be on Island D using control of effluent methods. Effluent will be directed towards the Manteo to Oregon Inlet Channel (east side) of the island.
- Changes in the island topography will be monitored. Aerial photographs of the Island will be digitized before and after each Walter Slough disposal event to determine basic changes the Island and adjacent habitats directly attributable to the Walter Slough project. This information will be coordinated with the FWS, the NMFS, NPS and the NC Department of Environment and Natural Resources. Appropriate mitigation will be implemented following agency coordination. The goal of the mitigation will be no net loss of SAV habitat attributable to the Walter Slough project. Some minor changes in size and shape of SAV habitat polygons attributable to natural fluctuations are acceptable.

5.0 Finding Of No Significant Impact

All comments received on the EA have been resolved either through project modification or providing additional information. I conclude that the proposed action will not significantly affect the quality of the human environment; therefore, an environmental impact statement will not be prepared.

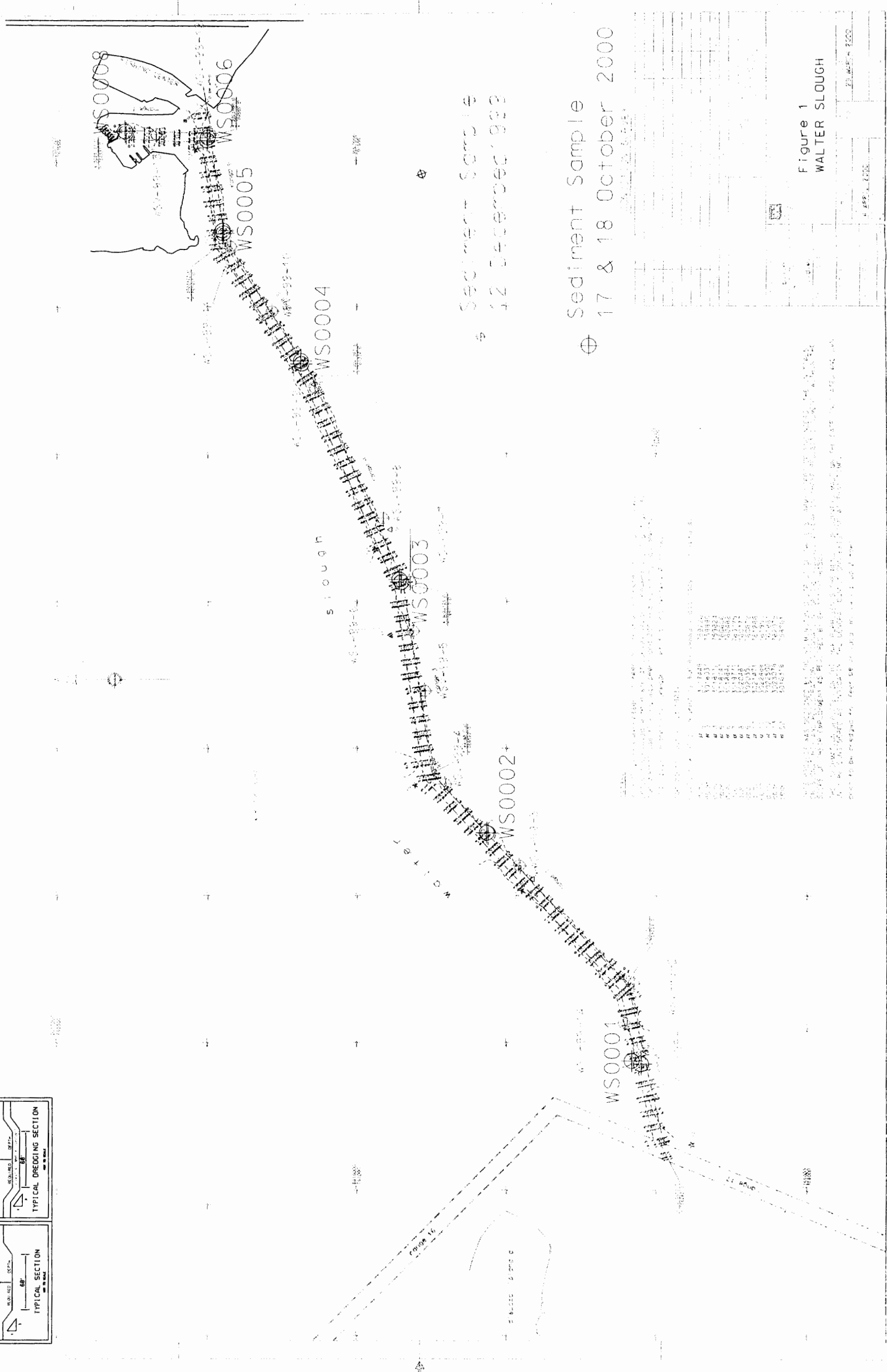
Date: 25 June 02

Signature:  PE
 Charles R. Alexander, Jr. DDE/PM
 Colonel, U.S. Army
 District Engineer

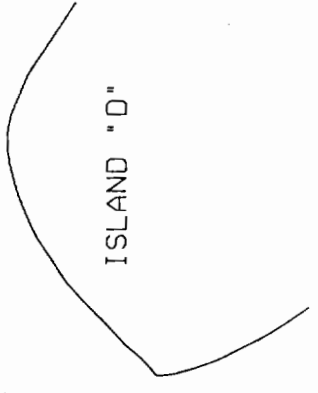
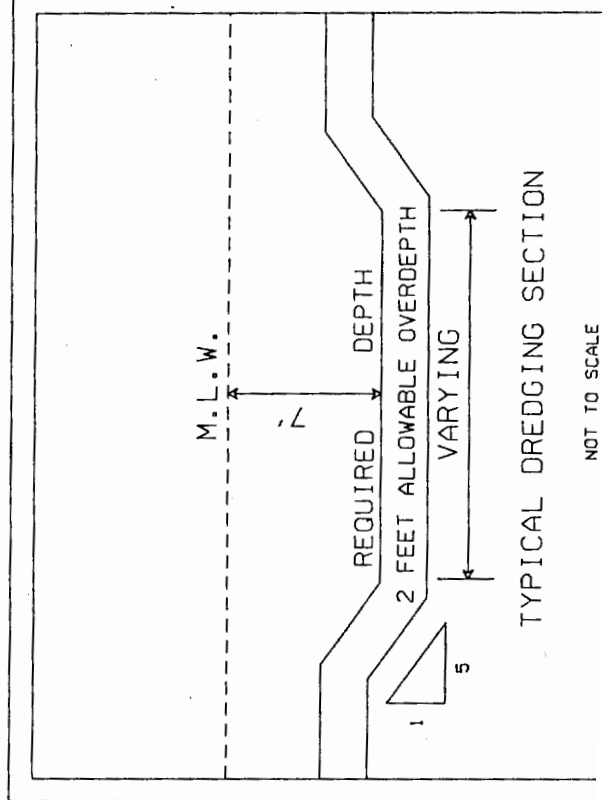
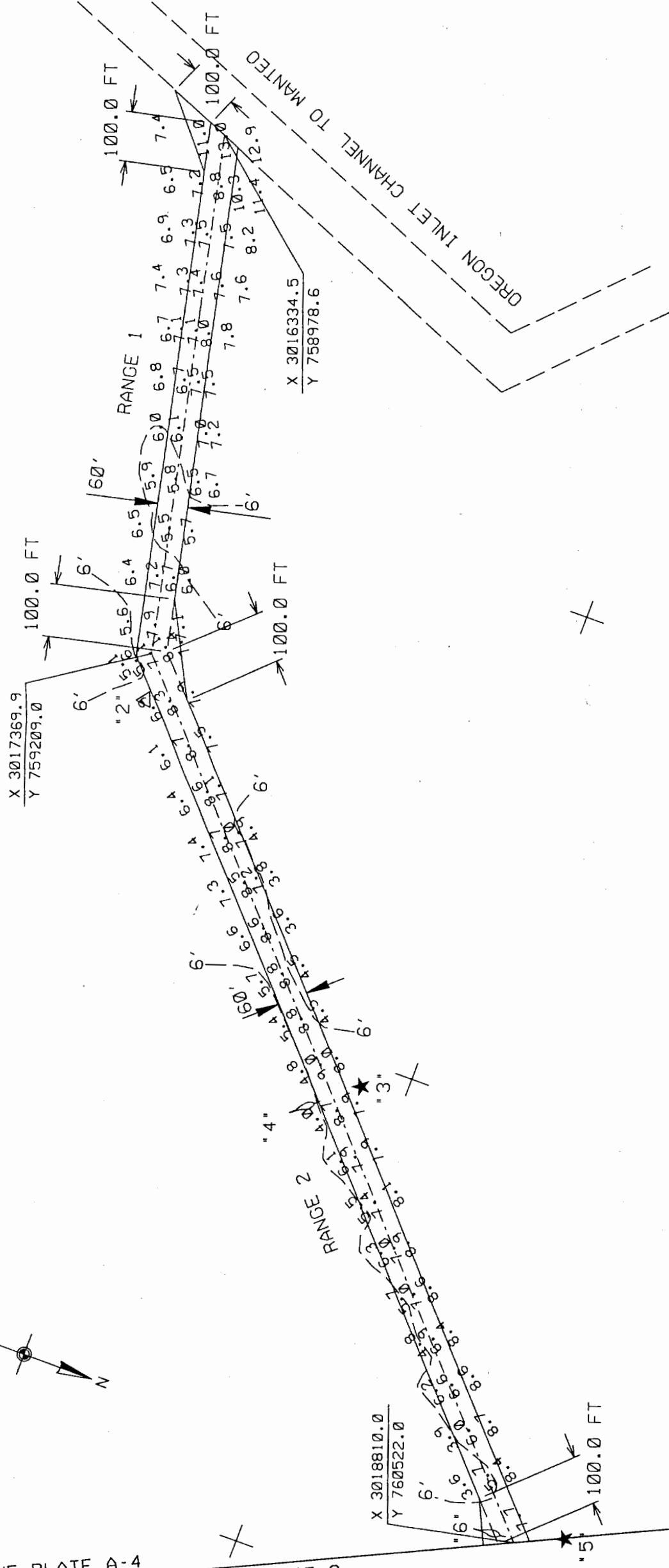
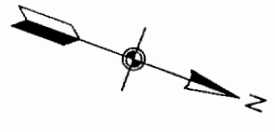
W. Eugene Tickner
 Acting Commander

APPENDIX A

**WALTER SLOUGH SEDIMENT SAMPLING AND ANALYSIS
DECEMBER 1999 AND OCTOBER 2000**



MATCH LINE PLATE A-4
 STA 19+40 RANGE 2 - STA 0+00 RANGE 3



WALTER SLOUGH
 DARE COUNTY, NC
 CHANNEL PLAN
 RANGE 1 AND RANGE 2
 SCALE 1"=3000'

Figure 2-1

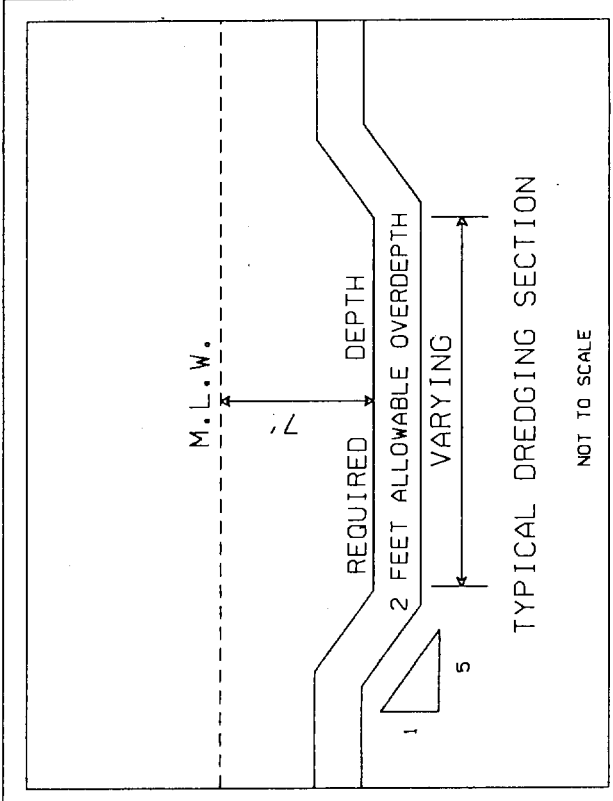


Figure 2-2

Figure 2-3

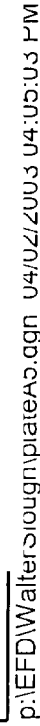


Table 1. Compounds and Characteristics Analyzed for Walter Slough Sediments

PAHs - Polyaromatic Hydrocarbons (EPA Method 8310)	Pesticides (EPA Method 8080)	Organotins (GCMS)	Metals (EPA Method 6010)
naphthalene	aldrin	monobutyltin	Aluminum (Al)
acenaphthylene	A-BHC	dibutyltin	Antimony (Sb)
acenaphthene	B-BHC	tributyltin	Arsenic (As)
fluorene	D-BHC	tetrabutyltin	Beryllium (Be)
phenanthrene	lindane		Cadmium (Cd)
anthracene	chlordane		Chromium (Cr)
fluoranthene	4,4'-DDE		Copper (Cu)
pyrene	4,4'-DDD		Lead (Pb)
benzo(a)anthracene	4,4'-DDT		Nickel (Ni)
chrysene	dieldren		Selenium (Se)
benzo(b)fluoranthene	endosulfan I		Silver (Ag)
benzo(k)fluoranthene	endosulfan II		Thallium (Tl)
benzo(a)pyrene	endosulfan sulfate		Zinc (Zn)
indeno(1,2,3-c,d)pyrene	endrin		Mercury (Hg) (EPA 7471)
dibenzo(a,h)anthracene	endrin aldehyde		Total Organic Carbon (TOC) ¹
benzo(g,h,i)perylene	endrin ketone		
1-methylnaphthalene	heptachlor		
2-methylnaphthalene	heptachlor epoxide		
	methoxychlor		
	toxaphene		
TPH - Total Petroleum Hydrocarbon (EPA Method 9071)			Physical Characteristics ²
			Grain Size
			Specific Gravity
			Percent Solids
			Total Organic Carbon (TOC) ¹

¹ EPA Method 9060

² Specific Gravity Method API-IA 1992 2710F
Grain Size Method ASTM D-422

Table 1. Summary of sampling information for sediments collected from Walter Slough project area December 1999. Samples were collected with vibracore. See Figure 1 for locations.

SAMPLE ID	DATE	NC STATE PLANE COORDINATES	CURRENT DEPTH (ft) mhw	SAMPLE DEPTH (ft mhw)	CLASSIFICATION	MEDIAN GS (mm)	% Silt/Clay % Passing 200 sieve	CLASSIFICATION	SCORE LOG NOTES
WSV-99-1	12-Dec-99	3016383 7590655	7.9	8.0 to 8.5	ML	<0.074	84.4	ML	Dark Grained silt with little sands
WSV-99-2-1	12-Dec-99	3017401 7591148	5.9	6.0 to 6.6	SP	0.17	5.3	SP	Olive gray poorly graded sand with trace silt
WSV-99-3-1	12-Dec-99	3018202 759910	3.9	4.0 to 4.5	SP-SM	0.2	9.5	SP-SM	Olive gray poorly graded sand with trace silt
WSV-99-3-2	12-Dec-99	3018202 759910	3.9	7.0 to 7.5	SP	0.17	1.6	SP	Light Gray poorly graded sand with trace silt
WSV-99-4-1	12-Dec-99	3018753 760408	4.4	4.5 to 5.0	SP	0.22	0.3	SP	Light brown poorly graded sand with trace of silt and shell
WSV-99-4-2	12-Dec-99	3018753 760408	4.4	7.5 to 8.0	SP	0.23	1.1	SP	Light gray poorly graded sand with trace silt
WSV-99-5-1	12-Dec-99	3019388 760544	6.4	6.5 to 7.0	SP	0.21	0.8	SP	Light gray poorly graded sand with trace silt
WSV-99-5-2	12-Dec-99	3019388 760544	6.4	9.5 to 10.0	SP	0.19	2.9	SP	Light gray poorly graded sand with trace silt and shell
WSV-99-6-1	12-Dec-99	3019800 760623	3.2	3.5 to 4.0	SP	0.21	2.5	SP	Light gray poorly graded sand with trace silt and shell
WSV-99-6-2	12-Dec-99	3019800 760623	3.2	6.0 to 6.5	SP	0.22	1.8	SP	Light brown poorly graded sand with trace silt
WSV-99-6-3	12-Dec-99	3019800 760623	3.2	8.0 to 8.5	SP	0.23	0	SP	Light gray poorly graded sand
WSV-99-7-1	12-Dec-99	3020134 760645	3.4	3.5 to 4.0	SP	0.23	2.3	SP	Dark brown poorly graded sand with trace silt
WSV-99-7-2	12-Dec-99	3020134 760645	3.4	6.0 to 6.5	SP	0.19	0.6	SP	Light gray poorly graded sand with trace silt and shell
WSV-99-7-3	12-Dec-99	3020134 760645	3.4	8.5 to 9.0	SP	0.25	0.7	SP	Light gray poorly graded sand with trace silt and shell
WSV-99-8-1	12-Dec-99	3020565 760826	4.5	4.5 to 5.0	SP	0.22	2.1	SP	Light gray poorly graded sand with trace shell
WSV-99-8-2	12-Dec-99	3020565 760826	4.5	7.0 to 7.5	ML	<0.074	87.2	ML	Dark gray elastic silt with little sand and trace organics
WSV-99-8-3	12-Dec-99	3020565 760826	4.5	9.0 to 9.5	SP	0.24	1.2	SP	Light gray poorly graded sand with trace silt and shell
WSV-99-9-1	12-Dec-99	3021453 761281	5.0	5.0 to 5.5	ML	<0.074	90.1	ML	Dark gray silt with few sands and trace organics
WSV-99-9-2	12-Dec-99	3021453 761281	5.0	6.4 to 6.9	SP	0.2	2.2	SP	Light gray poorly graded sand with trace silt and shell
WSV-99-9-3	12-Dec-99	3021453 761281	5.0	8.0 to 8.5	SP	0.25	0.3	SP	Light gray poorly graded sand with trace silt and shell
WSV-99-10-1	12-Dec-99	3021966 761566	5.0	5.0 to 5.5	ML	<0.074	72.3	ML	Dark gray sandy silt with trace organics
WSV-99-10-2	12-Dec-99	3021966 761566	5.0	7.5 to 8.0	ML	<0.074	91.1	ML	Dark gray silt with few sands and trace organics
WSV-99-10-3	12-Dec-99	3021966 761566	5.0	8.0 to 8.5	SP	0.2	2.2	SP	Olive gray poorly graded sand with trace silt and shells
WSV-99-11-1	12-Dec-99	3022413 761842	4.0	4.0 to 4.5	SP	0.23	2.1	SP	Light gray poorly graded sand with trace silt
WSV-99-11-2	12-Dec-99	3022413 761842	4.0	6.0 to 6.5	SP	0.22	1.7	SP	Light gray poorly graded sand with trace silt
WSV-99-11-3	12-Dec-99	3022413 761842	4.0	8.0 to 8.5	SP	0.22	1.9	SP	Light gray poorly graded sand with trace silt
WSV-99-12-1	12-Dec-99	3023189 761979	4.5	4.5 to 5.0	SP	0.21	1.2	SP	Light gray poorly graded sand with trace silt
WSV-99-12-2	12-Dec-99	3023189 761979	4.5	7.5 to 8.0	SP	0.22	1.8	SP	Light gray poorly graded sand with trace silt and trace shell
WSV-99-13-1	12-Dec-99	3023187 762335	8.5	8.5 to 9.0	ML	<0.074	94.5	ML	Dark gray silt with few sands
WSV-99-14-1	12-Dec-99	3017135 759211	5.6	5.6 to 6.1	SP	0.2	2.7	SP	Brown poorly graded sand with tracer silt and shell
WSV-99-14-2	12-Dec-99	3017135 759211	5.6	7.1 to 7.6	ML	<0.074	78.9	ML	Dark gray silt with few sands

Table 2 Summary of sampling information for sediments collected October 2000 from Walter Slough project area. Samples were collected with vibracore. See Figure 1 for locations.

SAMPLE ID	DATE/TIME	NC STATE PLANE COORDINATES	CURRENT DEPTH (ft) mlw	SAMPLE DEPTH (ft) mlw	CLASSIFICATION	CORE LOG NOTES
WS00001	17-Oct-00 1000	3016882.7 759158.8	7.5	7.0 to 7.75 7.75 to 9.0	SP CH	Five grain sand, tan, clean, very minor shell content. Gray color Mud with fine grain sands and filled burrows. Sand and burrowing
WS00001A	17-Oct-00 1020	3016882.7 759158.8	7.5	7.5 to 8.0 8.0 to 9.0	SP CH	Tan, fine grained sand, clean with minor shell and rafted organics present. Mud with fine grained sand filled burrows. Sand and burrowing increasing with depth. Mud moderately water saturated.
WS00002	17-Oct-00 1100	3018425.7 760128.3	7.75	7.75 to 8.5 8.5 to 8.65	SC SC	Black muddy sand. Sand fraction is fine grained with minor rafted organics present. Flaser bedded sand with mud laminations. Two distinct laminations, both black mud interbedded with gray fine grained sand. Moderate rafted organic material present.
WS00002A*	17-Oct-00 1120	3018425.7 760128.3	7.75	8.65 to 9.0 7.75 to 8.65	SP SC	Clean, gray, fine grained well sorted sand. Black muddy sand. Sand fraction is fine grained with minor rafted organics present.
WS00003	17-Oct-00 1250	3020148.5 760714.9	5.3	8.65 to 9.0 5.3 to 9.0	SP	Clean, gray, fine grained well sorted sand. Gray fine grain clean sand. Mud laminations at 0.25'. At 2.0' sand is fine grained but moderately sorted. Some medium shell frag- ments present. Shell content increases with depth.
WS00004	17-Oct-00 1316	30201629.8 761372.9	8.25	8.25 to 9.0	CH	Black water saturated mud with little if any sand present.
WS00004A*	17-Oct-00 1330	30201629.8 761372.9	8.25	8.25 to 9.0	CH	Black water saturated mud with little if any sand present.
WS00004B*	18-Oct-00 1345	30201629.8 761372.9	8.25	8.25 to 9.0	CH	Black water saturated mud with little if any sand present.
WS00005	18-Oct-00 810	3022490.3 762137.1	8.42	8.42 to 9.0	CH	Black water saturated mud. Minor organics in top 3".
WS00005A*	18-Oct-00 825	3022490.3 762137.1	8.42	8.42 to 9.0	CH	Black water saturated mud. Minor organics in top 3".
WS00005B*	18-Oct-00 840	3022490.3 762137.1	8.42	8.42 to 9.0	CH	Black water saturated mud. Minor organics in top 3".
WS00005C*	18-Oct-00 855	3022490.3 762137.1	8.42	8.42 to 9.0	CH	Black water saturated mud. Minor organics in top 3".
WS00006	18-Oct-00 900	3023153.3 761990.9	6.0	6.0 to 9.0	SP	Gray fine to medium sand, clean. Minor amount of shell fragments increasing with depth.
WS00007	18-Oct-00 915	3023153.3 761990.9	6.0	6.0 to 9.0	SP	Gray fine to medium sand, clean. Minor amount of shell fragments increasing with depth.
WS00008	18-Oct-00 1000	3023200.2 762542.0	6.3	6.3 to 7.25 7.25 to 7.75 7.75 to 9.0	CH SP CH	Black water saturated mud. Minor organics in top 3". Gray fine to med. clean sand. Minor amount shell fragments increasing with depth. Dark gray mud. Tighter than 0.0 to 0.92. Sand stringers present

Note: * represents an additional core sample taken to provide sufficient sample for laboratory analyses.

Table 3. Grain size analyses and physical parameters, Walter Slough project sediments. Samples collected 17-18 October 2000. See Figure 1 for sample locations.

SAMPLE LOCATION	GRAVEL	SAND	SILT	CLAY	SPECIFIC GRAVITY g/ml	PERCENT SOLIDS	TOC%
	(> sieve # 4)	(<sieve # 4 -> # 200)	<sieve # 200)				
	> 1.651 mm	> 0.417 mm < 1.651 mm	> 0.005 mm < 0.074 mm	< 0.005 mm			
WS0001	0.0	51.5	33	15.5	1.64	61.3	1.4
WS0002	0.0	83.5	12.4	4.1	0.64	71.0	0.47
WS0003	0.0	95.9	3.3	0.8	1.46	81.2	<0.25
WS0004	0.0	6.9	58.4	34.7	1.35	28.0	3.8
WS0005	0.0	14.9	57.4	27.7	0.86	31.4	3.7
WS0006	0.0	98.2	1.8	0.0	2.17	78.8	<0.25
WS0007	0.2	98	1.8	0.0	2.06	81.0	<0.25
WS0008	4.8	40.5	1.8	23.1	1.35	47.1	2.1

Notes:

TOC by Kahn - Modi

Table 4. Results of metals analyses on Walter Slough project sediments. Samples collected 17-18 October 2000.
See Figure 1 for sample locations.

Station	Al	Sb	As	Be	Cd	Cr	Cu	Pb	Ni	Se	Ag	Tl	Zn	Hg
WS0001	7500	1.1	5.7	0.42	0.16U	17	6.4	10	9.8	0.82U	0.33U	1.6U	41	0.034
WS0002	3200	0.72U	2.5	0.21	0.14U	8.4	2.4	3.2	4.7	0.72U	0.29U	1.4U	19	0.013
WSC003	820	0.67U	0.86	0.13U	0.13U	2.5	0.33	1.5	1.2	0.67U	0.27U	1.3U	5.4	0.0048U
WS0004	15000	1.8U	13	0.85	0.36U	37	15	20	20	1.8U	0.71U	3.6U	80	0.067
WS0005	13000	1.2U	9.9	0.67	0.26U	30	14	16	16	1.2U	0.5U	2.5U	71	0.035
WS0006	390	0.6U	0.6U	0.12U	0.12U	1.5	0.24U	1.2	0.6U	0.6U	0.24U	1.2U	2.6	0.0036U
WS0007*	300	0.45U	0.45U	0.089U	0.089U	1.2	0.18U	1	0.45U	0.45U	0.18U	0.89U	2.2	0.0039U
WS0008	10000	0.9U	6.3	0.51	0.18U	24	20	18	12	0.9U	0.36U	1.8	76	0.077

Notes:

U - Undetectable, analyte not present above quantitation limit shown.

* - WS0007 is a field duplicate of WS0006.

Table 5. Polynuclear aromatic hydrocarbons (PAH) and Total Petroleum Hydrocarbon (TPH) analyses of Walter Slough project sediments. Detectable concentrations are shown in bold. See Figure 1 for sample locations. Samples collected 17-18 October 2000. Note changes in concentration limits.

PAH (EPA Method 8310)	WS0001	WS0002	WS0003	WS0004	WS0005	WS0006	WS0007	WS0008
naphthalene*	30U	48U	19U	42U	117U	19U	18U	67U
acenetaphthylene*	30U	24U	19U	21U	23U	19U	18U	43U
acenetaphthene*	60U	48U	19U	209U	117U	37U	18U	87U
fluorene*	30U	24U	19U	21U	23U	19U	18U	43U
phenanthrene*	30U	24U	19U	21U	23U	19U	18U	120
anthracene*	30U	24U	19U	21U	23U	19U	18U	43U
fluoranthene	30U	24U	19U	21U	23U	19U	18U	460
pyrene	30U	24U	19U	21U	23U	19U	18U	210
benzo[a]anthracene	30U	24U	19U	21U	23U	19U	18U	100
chrysene	30U	24U	19U	21U	23U	19U	18U	190
benzo[b]fluoranthene	30U	24U	19U	21U	23U	19U	18U	86
benzo[k]fluoranthene	30U	24U	19U	21U	23U	19U	18U	90
benzofluoranthene	30U	24U	19U	21U	23U	19U	18U	25
indeno[1,2,3-c,d]pyrene	30U	24U	19U	21U	23U	19U	18U	43U
dibenz[a,h]anthracene	30U	24U	19U	21U	23U	19U	18U	43U
benzo[ghi]perylene	30U	24U	19U	21U	23U	19U	18U	43U
1-methylnaphthalene*	30U	24U	19U	21U	23U	19U	18U	43U
2-methylnaphthalene*	U	U	U	U	U	U	U	43U
LMWPAH (* above)	U	U	U	U	U	U	U	120.0
HMWPAH	U	U	U	U	U	U	U	1161.0
Total PAH	U	U	U	U	U	U	U	1281.0
TPH (EPA Method 8071) (mg/kg)	28U	30U	29U	28U	40 mg/kg	27U	29U	64U

Note:

LMWPAH - Low molecular weight PAHs (indicated by * above)

HMWPAH - High Molecular Weight PAHs

U - Undetectable, analyte not present above quantitation limit shown

Table 6. Chlorinated pesticide and polychlorinated biphenyls (PCBs) analyses of Walter Slough project sediments. Samples collected 17-18 October 2000. See Figure 1 for sample locations.

ANALYTE (by EPA 8080)	SEDIMENT CONCENTRATION (ug/kg)							
	WS0001	WS0002	WS0003	WS0004	WS0005	WS0006	WS0007	WS0008
aldrin	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
A-BHC	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
B-BHC	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
D-BHC	8.4U	7.5U	6.0U	24U	6.6U	6.0U	5.9U	8.8U
lindane	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
chlordan	28U	25U	20U	80U	66U	20U	20U	44U
4,4'-DDE	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
4,4'-DDD	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
4,4'-DDT	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
dieldren	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
endosulfan I	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
endosulfan II	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
endosulfan sulfate	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
endrin	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
endrin aldehyde	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
endrin ketone	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
heptachlor	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
heptachlor epoxide	8.4U	7.5U	6.0U	12U	6.6U	6.0U	5.9U	8.8U
methoxychlor	8.4U	7.5U	6.0U	56U	6.6U	6.0U	5.9U	8.8U
toxaphene	28U	25U	20U	80U	66U	20U	20U	44U
Aroclor-1016	28U	25U	20U	80U	66U	20U	20U	44U
Aroclor-1221	28U	25U	20U	80U	66U	20U	20U	44U
Aroclor-1232	28U	25U	20U	80U	66U	20U	20U	44U
Aroclor-1242	28U	25U	20U	80U	66U	20U	20U	44U
Aroclor-1248	28U	25U	20U	80U	66U	20U	20U	44U
Aroclor-1254	28U	25U	20U	80U	66U	20U	20U	44U
Aroclor-1260	28U	25U	20U	80U	66U	20U	20U	44U

Note:

U - Undetectable, analyte not present above quantitation limit shown.

Table 7. Organotins in Walter Slough project sediments.
Samples collected October 2000. See Figure 1 for sample locations.

SEDIMENT CONCENTRATION (UG/KG DRY WEIGHT)

ANALYTE (by SW8270C_TB_TIN) WS0008

monobutyltin	NA
dibutyltin	NA
tributyltin	7.19U

Notes:

U - Undetectable, analyte not present above quantitation limit shown.

NA - Not available, laboratory error.

Table 8. Total Petroleum Hydrocarbon (TPH) and MADEP Volatile Petroleum Hydrocarbon (VPH) / Extractable Petroleum Hydrocarbon (EPH) analyses of Walter Slough project sediments. See Figure 1 for sample locations. Samples collected 17-18 October 2000. Note the changes in concentration units. Detectable amounts are shown in bold.

Analyte	SEDIMENT CONCENTRATION (dry weight)							
	WS0001	WS0002	WS0003	WS0004	WS0005	WS0006	WS0007	WS0008
TPH mg/kg	28U	30U	29U	28U	40	27U	29U	64U
VPH ug/kg								
C ₅ - C ₉ Aliphatics	10U	10U	10U	10U	10U	10U	10U	10U
C ₉ - C ₁₂ Aliphatics	10U	10U	10U	10U	10U	10U	10U	10U
C ₉ - C ₁₀ Aromatics	10U	10U	10U	10U	10U	10U	10U	10U
EPH mg/kg								
C ₉ - C ₁₈ Aliphatics	10U	10U	10U	10U	10U	10U	10U	10U
C ₁₉ - C ₃₆ Aliphatics	10U	10U	10U	10U	10U	10U	10U	10U
C ₁₁ - C ₂₂ Aromatics	10U	10U	10U	10U	10U	10U	10U	10U

Notes:

TPH - Total Petroleum Hydrocarbons by EPA Method 9071

VPH - Volatile Petroleum Hydrocarbon - Massachusetts Department of Environmental Protection

A measure of the collective concentration of extractable aliphatic and aromatic petroleum hydrocarbons in sediment

EPH - Extractable Petroleum Hydrocarbon - Massachusetts Department of Environmental Protection

A measure of the collective concentration of volatile aliphatic and aromatic petroleum hydrocarbons in sediment

U - Undetectable, analyte not present above quantitation limit shown.

APPENDIX B

LETTERS AND MEMORANDA RECEIVED DURING THE EA COMMENT PERIOD



United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240



ER99/925

OCT 19 1999

Colonel James W. DeLony
District Engineer
Department of the Army
Wilmington District, Corps of Engineers
P.O. Box 1890
Wilmington, North Carolina 28402-1890

Dear Colonel DeLony:

This is in regard to the request for the Department of the Interior's comments on the Section 107 Draft Detailed Project Report and Environmental Assessment for the Walter Slough, Dare County, North Carolina.

This is to inform you that the Department will have comments, but will be unable to reply within the allotted time. Please consider this letter as a request for an extension of time in which to comment.

Our comments should be available by December 1, 1999.

Sincerely,

Terence N. Martin

Terence N. Martin, P.E.
Team Leader, Natural Resources
Management
Office of Environmental Policy
and Compliance



UNITED STATES
DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

OUTER BANKS GROUP

Cape Hatteras National Seashore

Fort Raleigh National Historic Site

Route 1, Box 675, Manteo, North Carolina 27954-2708

Cape Lookout National Seashore

Wright Brothers National Memorial

IN REPLY REFER TO:

L30 (SUP)

XL76 (CAHA)

November 29, 1999

Action: TS

CF: DE

DX

DP

PM

RG

Colonel James W. DeLony, District Engineer
US Army Engineer District, Wilmington
P. O. Box 1890
Wilmington, North Carolina 28402-1890

Dear Colonel DeLony:

This letter is in response to your request for comments on the proposed dredging of Walter Slough, Dare County, North Carolina. Staff at Cape Hatteras National Seashore has responded to this proposal because several phases of the project could impact the Seashore and adjacent resources, if implemented. Furthermore, Cape Hatteras National Seashore must issue a Special Use Permit before any project activity can occur on National Park Service land. We appreciate the opportunity to express our concerns well in advance of the proposed dredging of Walter Slough.

The US Army Corps of Engineers (USACOE) has not developed this proposal in consultation with Cape Hatteras National Seashore as the document has indicated in several areas. Discussions about the proposed dredging of Walter Slough were begun with Mr. Daniel Small in the fall and winter of 1998, at Mr. Small's initiative. At that time, even though the project was not authorized or funded, Cape Hatteras National Seashore spent a great deal of time responding to the proposed future dredging of Walter Slough. Cape Hatteras National Seashore's position was presented in a letter to Mr. Ben Lane of the USACOE (Appendix E of the Environmental Assessment - Correspondence). That letter stated that "...we do not support the option of disposal on the beaches of Bodie Island." Furthermore, additional concerns were expressed by Cape Hatteras National Seashore staff in a letter to Mr. Small (Appendix E of the Environmental Assessment - Correspondence). Discussions continued in January and February 1999 with Mr. Small in which Cape Hatteras National Seashore was clear in its position to not support beach disposal. Since those discussions, no contact has been made by the USACOE to develop the proposal under consideration concurrently with Cape Hatteras National Seashore. We were very surprised to be asked to review this document identifying beach disposal on National Park Service land as the preferred method for dredge spoil disposal considering our stated position. Our position remains that we do not support the disposal of Walter Slough Channel dredge spoil sediments on the beaches of Cape Hatteras National Seashore. This position is based on the following concerns:

1. Direct, cumulative, and potential impacts to beach organisms (mole crab, coquina clam, ghost crab) from deposition of dredge spoil disposal is not compatible with National Park Service and Cape Hatteras National Seashore policies and objectives. Derogation and destruction of National Park Service and Cape Hatteras National Seashore resources is in direct conflict with the National Park Service Organic Act of 1916, the Redwood Act as amended in 1978, and National Park Service Management Policies (1988).
2. Impact to habitats and organisms, including submerged aquatic vegetation, salt marsh, and upland dune systems along the proposed pipeline route is not compatible with National Park Service and Cape Hatteras National Seashore policies and objectives.

3. Dredge disposal sediments have not been adequately evaluated for compatibility with existing beach sediments at the proposed disposal site.
4. A contaminant analysis has not been conducted on material from the channel or basin sediments. All material that has the potential to affect Cape Hatteras National Seashore resources must be thoroughly analyzed before consideration can be given to permitting disposal of dredged material on any National Park Service lands, including upland disposal sites (see letter of April 16, 1999, from Superintendent Robert W. Reynolds).
5. Direct, indirect, cumulative, and potential impacts that dredged material deposit may have on the nesting ability and hatching success of three species of threatened or endangered sea turtles that nest in the Cape Hatteras National Seashore have not been evaluated. Consultation with the US Fish and Wildlife Service should be initiated to determine these impacts.
6. The potential and cumulative impact this project may have on other related dredging and coastal projects in the area has not been discussed or evaluated. Although the USACOE states that the amount of material to be potentially disposed of on the beach is minimal and will not affect other operations in the area, Cape Hatteras National Seashore believes that potential cumulative impacts of this project and other related projects must be considered. Our concern is that beach disposal of dredged materials from this project may potentially be a significant impact to beach organisms and existing dredging operations in Oregon Inlet. The amount of material proposed to be dredged over the project life must take into consideration the proposed future replenishment of Dare County beaches. Our position is that these projects and their potential and cumulative impacts on resources and operations must be accounted for in considering the potential and cumulative impacts of this proposal.

Cape Hatteras National Seashore has contacted North Carolina Wildlife Resources Commission (NCWRC) staff to investigate the feasibility of the USACOE using Island D or other islands in the vicinity of Walter Slough as dredge spoil deposit areas. Indications from NCWRC are that two islands, Parnell Island and Wells Island, in addition to Island D, are suitable dredge spoil deposit sites and in need of dredge spoil sediments. The NCWRC would like to use this material to enhance bird nesting areas on these islands. Cape Hatteras National Seashore encourages you to contact the NCWRC and evaluate the use of these islands as dredge material deposit areas.

Cape Hatteras National Seashore requires that the USACOE provide a grain size and contaminant analysis for the material to be deposited in the upland site near the US Coast Guard Station. Additionally, any alteration of the size and elevation of the final upland disposal site must be provided to my staff before approval can be given to use this site for disposal of Oregon Inlet Fishing Center basin or Walter Slough Channel dredged sediments.

Cape Hatteras National Seashore encourages the USACOE to begin planning and development of alternative sites for disposal of dredged channel sediments for future projects. Other less environmentally damaging alternatives are possible and potentially resource enhancing uses of this material are available in the area.

We appreciate the opportunity to comment on this proposal. If you have further questions, please contact Mr. Steve Harrison at (252) 473-2111, extension 159.

Sincerely,



Christine Bernthal
Acting Superintendent
Outer Banks Group



United States Department of the Interior

OFFICE OF THE SECRETARY

OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE

Richard B. Russell Federal Building
75 Spring Street, S.W.
Atlanta, Georgia 30303

Action: TS
CF: DE
DD
DX
DP
PM
RG

November 30, 1999

ER-99/925

Colonel James W. DeLony
U. S. Army Corps of Engineers
Wilmington District
P. O. Box 1890
Wilmington, NC 28402-1890

Dear Colonel DeLony:

The Department of the Interior has reviewed the Draft Detailed Project Report and the Environmental Assessment (EA) for the proposed dredging operation of Walter Slough Channel, from the Oregon Inlet Fishing Center (OIFC) to the Oregon Inlet Channel, in Dare County, North Carolina, as requested. Walter Slough is an existing non-Federal channel located just north of Oregon Inlet, extending approximately 1.5 miles from the west side of Bodie Island southwesterly into Pamlico Sound. The OIFC is part of the Cape Hatteras National Seashore (CHNS), owned by the National Park Service (NPS) and operated by a concessionaire.

The Fish and Wildlife Service (FWS) does not concur with the determination that the proposed action would not likely adversely affect Federally-listed species or important aquatic habitat. Furthermore, there are outstanding concerns regarding cumulative impacts to fish and wildlife resources, primarily related to the numerous Federal projects proposed, scheduled, and/or ongoing in the Outer Banks ecosystem.

The EA evaluates the proposal by the U.S. Army Corps of Engineers, Wilmington District (Corps) to dispose of dredged material from the Walter Slough Channel on beaches within the CHNS and an upland diked disposal area near the U.S. Coast Guard (USCG) station on the west side of Bodie Island. The proposed action will consist of dredging the existing channel, using a 12-inch hydraulic pipeline dredge, to a width of 60 feet and a depth of 7 feet below mean low water (m.l.w.) with 2 feet of allowable overdepth. A 33-foot buffer zone will exist between the dredged channel and any submerged aquatic vegetation (SAV). The majority of the dredged material is proposed to be placed below the 6-foot contour of the oceanside beach within the CHNS. This dredged material is mainly tan/gray fine to medium sand with a trace of silt and shell fragments. The dredged material removed from the channel near the OIFC will be placed on the upland diked area near the USCG station. This dredged material is predominantly brown sandy silt/clay and is unsuitable for beach disposal. The alternate disposal site, Island D (pg. EA-3, Figure 2), is not considered adequate for disposal of dredged material over the life of the project because this area is limiting in size. The project life is 50 years with proposed maintenance dredging every four years, and the total amount of material expected to be dredged is approximately 600,000 cubic yards (84,000 initial dredging + 50,000/4-year

cycle). Initial construction would begin in December 2001. The EA provides an adequate discussion of the purpose and need for this project (Section 2.0) and the alternatives considered by the Corps (Section 5.0).

General Comments

The FWS has concerns about the impacts of the Walter Slough project in conjunction with other projects proposed, scheduled, and/or ongoing within the Outer Banks ecosystem. Specifically, there are concerns with the proposed channel deepening and construction of jetties at Oregon Inlet to protect the navigation channel. The dredged material from the Walter Slough project, proposed for deposition on NPS lands updrift from Oregon Inlet, is fine to medium sand that will likely have a higher erosion rate than the existing sand. The FWS is not aware of an accounting of this additional sediment from the proposed Walter Slough project in the calculations for the Oregon Inlet project. As we are concerned with recent reductions in the budget for Federally-maintained dredging projects, we feel this added sediment may present new challenges to maintaining safe and reliable navigation through Oregon Inlet. Without accurate sediment calculations, the navigation channel may experience additional shoaling not accounted for in the current environmental documentation for that project. This additional sediment may result in advanced maintenance operations or an immediate or crisis response to support navigation, potentially causing greater impacts to fish and wildlife resources.

In the past, similar Corps projects have been modified from the approved project operation plan because of limited funding or unexpected shoaling and obstructing in the navigable channel. This has led to advanced maintenance activities (i.e., increasing the depth and/or width of a channel to prevent shoaling and impairing navigation before the next scheduled maintenance dredging) or requests for excessive project expansions or modifications, resulting in additional impacts to fish and wildlife resources. The potential impacts of such Corps projects are not often adequately presented for review by the resource agencies, and the probable affects on fish and wildlife resources never accounted for (e.g., Oregon Inlet; Roanoke Sound, Manteo Harbor, Masonboro Inlet). We fear this may occur again with the proposed Walter Slough Channel project, and strongly suggest the Corps critically evaluate all projects within the Outer Banks ecosystem when assessing the cumulative impacts of this project. As a secondary impact, the sand proposed for deposition on NPS lands has the potential to cause problems at Oregon Inlet, and requires consideration in the EA under the National Environmental Protection Act (NEPA). Additionally it seems incongruous that a recommendation is made that this existing channel be federalized and become an additional federal responsibility for continued maintenance when budgets for maintenance projects are being reduced by Congress. We believe the maintenance of the channel should remain a county responsibility.

The Corps has not developed this proposal in consultation with CHNS staff as the document has indicated in several areas. Discussions about the proposed dredging of Walter Slough were begun with Mr. Daniel Small in the fall and winter of 1998, at Mr. Small's initiative. At that time, even

though the project was not authorized or funded, CHNS staff spent a great deal of time responding to the proposed future dredging of Walter Slough. The CHNS position was presented in a letter to Mr. Ben Lane of the Corps (Appendix E of the Environmental Assessment – Correspondence). That letter stated that “we do not support the option of disposal on the beaches of Bodie Island.” Furthermore, additional concerns were expressed by CHNS in a letter to Mr. Small (Appendix E of the Environmental Assessment – Correspondence). Discussions continued in January and February of 1999 with Mr. Small in which CHNS was clear in its position to not support beach disposal. Since those discussions, no contact has been made by the Corps to develop the proposal under consideration concurrently with CHNS. We were very surprised to be asked to review this document identifying beach disposal on NPS land as the preferred method for dredge spoil disposal considering the previously stated position. The position remains that the NPS does not support the disposal of Walter Slough Channel dredge spoil sediments on the beaches of CHNS. This position is based on the following concerns:

1. Direct, cumulative, and potential impacts to beach organisms (mole crab, coquina clam, ghost crab) from deposition of dredge spoil disposal is not compatible with NPS and CHNS policies and objectives. Derogation and destruction of NPS and CHNS resources is in direct conflict with the NPS Organic Act of 1916, the Redwood Act as amended in 1978, and NPS Management Policies (1988).
2. Project impacts to habitats and organisms, including submerged aquatic vegetation, salt marsh, and upland dune systems along the proposed pipeline route is not compatible with NPS and CHNS policies and objectives.
3. Dredge disposal sediments have not been adequately evaluated for compatibility with existing beach sediments at the proposed disposal site.
4. A contaminant analysis has not been conducted on material from the channel or basin sediments. All material that has the potential to affect CHNS resources must be thoroughly analyzed before consideration can be given to permitting disposal of dredged material on any NPS lands, including upland disposal sites (see letter of April 16, 1999, from Superintendent Robert W. Reynolds).
5. Direct, indirect, cumulative, and potential impacts that dredged material deposit may have on the nesting ability and hatching success of three species of threatened or endangered sea turtles that nest in the CHNS have not been evaluated. Consultation with FWS should be initiated to determine these impacts.
6. The potential and cumulative impact this project may have on other related dredging and coastal projects in the area has not been discussed or evaluated. Although the Corps states that the amount of material to be potentially disposed of on the beach is minimal and will not affect other

operations in the area, CHNS believes that potential cumulative impacts of this project and other related projects must be considered. The concern is that beach disposal of dredged materials from this project may potentially be a significant impact to beach organisms and existing dredging operations in Oregon Inlet. The amount of material proposed to be dredged over the project life must take into consideration the proposed future replenishment of Dare County beaches. Our position is that these projects and their potential and cumulative impacts on resources and operations must be accounted for in considering the potential and cumulative impacts of this proposal.

CHNS staff has contacted the North Carolina Wildlife Resources Commission (NCWRC) staff to investigate the feasibility of the Corps using Island D or other islands in the vicinity of Walter Slough as dredge spoil deposit areas. Indications from NCWRC are that two islands, Parnell Island and Wells Island, in addition to Island D, are suitable dredge spoil deposit sites and in need of dredge spoil sediments. The NCWRC would like to use this material to enhance bird nesting areas on these islands. CHNS encourages you to contact the NCWRC and evaluate the use of these islands as dredge material deposit areas.

CHNS requires the Corps provide a grain size and contaminant analysis for the material to be deposited in the upland site near the US Coast Guard Station. Additionally, any alteration of the size and elevation of the final upland disposal site must be provided to CHNS before approval can be given to use this site for disposal of Oregon Inlet Fishing Center basin or Walter Slough Channel dredged sediments. CHNS must issue a Special Use Permit before any project activity can occur on NPS land.

CHNS encourages the Corps to begin planning and development of alternative sites for disposal of dredged channel sediments for future projects. Other less environmentally damaging alternatives are possible and potentially resource enhancing uses of this material are available in the area.

Specific Comments

Sections 6.8, 6.9, and 7.6 of the EA consider potential project impacts on Federally-listed species. The EA concludes the proposed project is not likely to affect the roseate tern (*Sterna dougallii*), bald eagle (*Haliaeetus leucocephalus*), seabeach amaranth (*Amaranthus pumilus*), West Indian manatee (*Trichechus manatus*), American alligator (*Alligator mississippiensis*), and piping plover (*Charadrius melodus*). Based on the available information, the FWS concurs that the proposed project is not likely to adversely affect the above mentioned species. The EA also concludes the proposed project is not likely to affect the five resident species of sea turtles; green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempi*), loggerhead (*Caretta caretta*), hawksbill (*Eretmochelys imbricata*), and leatherback (*Dermochelys coriacea*). The FWS is responsible for sea turtles on the beach, whereas, the National Marine Fisheries Service (NMFS) is responsible for these same animals when they are in the water. All five species occur within the waters of North Carolina, however, only the green and

loggerhead sea turtles are known to nest on the beaches within the proposed project area. Before the FWS can concur with the Corps' determination that the project is not likely to adversely affect the nesting activities of any green and loggerhead sea turtles, we strongly suggest the Corps address the following issue:

- Compatibility analysis of dredged material and beach sand should be conducted before the placement of any dredged material on the beach. According to the EA, the dredged material proposed for beach disposal meets the > 90% sand criteria (pg. EA-6), but the compatibility of the beach sand and the dredged material has not been addressed. Deposition of dredged material not compatible with beach sand grain size, shape, and color can alter sea turtle behavior and augment sand compaction, resulting in an increase in the number of false crawls and aberrant nests, increased digging times for nesting females, unnatural sex ratios in hatchlings, and altering hatching success.

We suggest the Corps conduct compatibility analysis of dredged material and beach sand. If the results indicate compatibility of the materials, the FWS could then concur with the determination that the proposed project is not likely to adversely impact sea turtles.

Sections 6.5 and 7.3 of the EA consider potential project impacts on important Submerged Aquatic Vegetation (SAV) beds. The EA concludes the proposed project is not likely to affect SAV habitat, stating "the width of the navigation channel will be designed so as to avoid significant beds of SAV's" (pg. EA-12). However, in the response to the FWS Draft Coordination Act Report, the Corps states "the channel alignment will avoid SAV's, to the maximum extent practicable" and "either the channel alignment will be adjusted to avoid the SAV's or a mitigation plan which results in no net loss of SAV's will be developed and implemented" (pg. 1). The Corps continues in a response to the placement of the hydraulic pipeline with "the pipeline route from the dredge will be placed so as to avoid crossing known SAV's" (pg. 2). Based on the available information, the FWS does not concur that the proposed project is not likely to adversely affect important SAV beds. Before the FWS can concur with the Corps' determination, we strongly suggest the Corps address the following issue:

- An up-to-date survey for SAV habitat within the proposed action area should be conducted and a mitigation plan developed for the potential impacts to SAV beds prior to the start of proposed activities. According to the EA, the Corps will develop and implement a compensatory mitigation plan should SAV beds be impacted (pg. EA-17), but the specifics of the mitigation plan are not included. In addition, the Corps makes no mention of the need for future surveys for SAV habitat in proximity of the proposed action. SAV habitat is extremely important for the production of fishery resources, providing a refuge from predators and a nursery area for juveniles of a variety of species. The elimination of a mitigation plan from the EA increases the likelihood of inadequate mitigation design and increases additional review time for necessary mitigation information. Furthermore, insufficient or out-dated data can result in excessive and unnecessary impacts to SAV habitat.

- We suggest the Corps include an overview of the in-kind compensatory mitigation plan for potential impacts to SAV beds, including specific mitigation sites, and conduct a survey for the presence of SAV beds just prior to the onset of the proposed action. If included in the biological documentation, the FWS could concur with the determination that the proposed project would not likely adversely affect or result in the net loss of important SAV habitat.

Summary

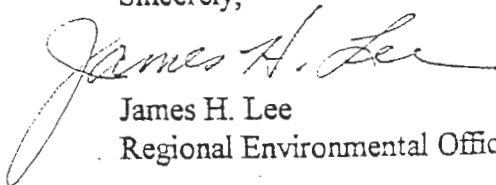
The current proposal for dredging of Walter Slough has not been developed in consultation with CHNS. A Special Use Permit (SUP) must be issued by CHNS before any project activity can occur on NPS land.

We believe the Corps has not adequately addressed the issues in their determination that the proposed action is not likely to adversely affect Federally-listed species and important SAV habitat. We recommend the preceding issues be fully addressed in the environmental documentation. In addition, we believe that the proposed Walter Slough dredging and disposal operation cannot be accomplished without significant impacts to fish and wildlife resources when considered in conjunction with the numerous Federal projects, ongoing and/or proposed, within the Outer Banks ecosystem. We suggest the Corps thoroughly evaluate ongoing, scheduled, and proposed projects for associated indirect impacts, and develop a contingency plan for the potential cumulative impacts resulting from multiple projects within the barrier island ecosystem. Some consideration of the federalization of this channel maintenance and the cumulative and indirect impacts of all continuing maintenance projects should be discussed in relationship to adoption of this plan. We are concerned that the recommendation to add another project did not consider the cumulative and related impacts to other existing federal projects. These issues should be completely and adequately discussed in the environmental documentation.

At this time, due to insufficient data on the project impacts on Federally-listed species, and the potential impacts to important SAV habitat, the FWS would not concur with a Finding of No Significant Impact (FONSI) for the proposed action. For those species in which the FWS concurs that the proposed project is not likely to adversely affect, we remind you that obligations under Section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; (3) a new species is listed or critical habitat determined that may be affected by the identified action.

Thank you for the opportunity to review and comment on this project report and EA. If there are questions regarding the Cape Hatteras National Seashore, please contact Steve Harrison at 252/473-2111, ext. 159. If there are questions regarding fish and wildlife comments, please contact Bruce Bell at 404/679-7089.

Sincerely,



James H. Lee
Regional Environmental Officer



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5312; FAX (727) 570-5517

NOV - 8 1999

F/SER3:EGH

Colonel James W. DeLony
District Engineer
Planning and Environmental Branch
Army Corps of Engineer, Wilmington District
P.O. Box 1890
Wilmington, NC 28402-1890

Dear Colonel DeLony:

This responds to your October 12, 1999 letter initiating section 7 consultation under the Endangered Species Act (ESA) of 1973, as amended, with reference to Water Slough dredging project, Dare County, North Carolina.

The method of material removal most likely to be used is a 12-inch hydraulic pipeline dredge. The dredge will remove the material from the channel and pipe it directly to the disposal sites. Approximately 84,000 cubic yards (CY) will be excavated for the initial construction. The construction period will likely fall between 1 January and 31 March. Maintenance dredging is predicted to be performed on a 4-year cycle with removal of approximately 50,000 CY each time, or a total of 600,000 CY over the 50-year life of the project.

The National Marine Fisheries Service (NMFS) has previously determined that use of a pipeline dredge is unlikely to adversely affect federally listed species under NMFS purview. Thus, use of a pipeline dredge would not require further consultation under section 7 of the ESA. In addition, NMFS has previously consulted (April 1999) with the COE Wilmington District on the use of small (CURRITUCK size-class) hopper dredges and small side cast dredges (FRY, MERRITT and SCHWEIZER) to dredge Eastern Seaboard coastal channel and inlets. NMFS concluded that these smaller dredges are unlikely to adversely affect listed species. Nevertheless, NMFS strongly recommends that the construction period be limited to the winter months as planned when abundance of federally-listed sea turtle species is lowest.

NMFS foresees potential adverse effects to endangered and threatened species under NMFS purview if a large commercial-type hopper dredge is used. These dredges are known to lethally take sea turtles and sturgeon. NMFS has previously consulted with the Corps of Engineers, South Atlantic District on the effects of using hopper dredges to dredge East Coast channels and offshore borrow areas (August 25, 1995; April 9, 1997; September 25, 1997). Because of the potential for adverse effects to listed species from hopper dredges, NMFS incorporated reasonable and prudent measures, terms and conditions, and conservation recommendations into



the preceding biological opinions. If COE Wilmington District intends using a hopper dredge (other than the exempted size class noted above) to conduct the described dredging activity, similar terms and conditions would be required to prevent/minimize adverse effects to sea turtles.

This concludes consultation responsibilities under Section 7 of the ESA. Consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified or critical habitat determined that may be affected by the identified activity.

We appreciate the opportunity to comment on this project and work with the COE to ensure the protection of threatened and endangered species under NMFS purview, and to help the COE fulfill its mandate under the ESA. Please contact Mr. Eric Hawk at 727/570-5312 if you have any questions or if we may be of assistance.

Sincerely,

Charles A. Oravetz

Charles A. Oravetz
Assistant Regional Administrator
Protected Resources Division

cc: F/SER4 - A. Mager
F/PR3

o:\section7\informal\waltslew.wil

File: 1514-22 f.1. COE Wilmington District



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive N
St. Petersburg, Florida 33702

November 9, 1999

Colonel James W. DeLony
District Engineer, Wilmington District
Department of the Army, Corps of Engineers
P. O. Box 1890
Wilmington, North Carolina 28402-1890

Attention Phil Payonk

Dear Colonel DeLony:

Please reference your October 12, 1999, request for a review and comments on the August 1999 Section 107 Draft Detailed Project Report (DPR) and Environmental Assessment (EA) for Walter Slough, Dare County, North Carolina, submitted by the Corps of Engineers (COE), Wilmington District. The subject DPR and EA evaluate the proposed 1.5-mile-long federal navigation project at Walter Slough. The purpose of the new federal project is to improve the existing channel and create a reliable connection between the Oregon Inlet Fishing Center, the U.S. Coast Guard Base, Oregon Inlet, North Carolina, and the existing federal channel that extends to the north and south of the proposed project site at Oregon Inlet, North Carolina. We have reviewed the subject documents and offer the following comments for your consideration.

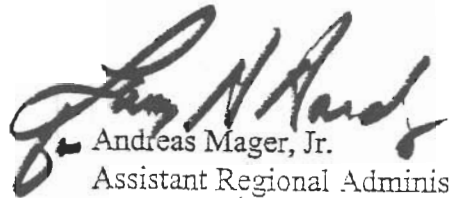
The DPR and EA describe the fishery resources found in the project area and the work's potential impacts on these resources. However, it should be noted that the project area supports essential fish habitat (EFH) for postlarval and juvenile red drum, white shrimp, brown shrimp, and other important fisheries. Categories of EFH common in coastal North Carolina include estuarine emergent wetlands, sand and mud substrates, estuarine water column, and submerged aquatic vegetation. Detailed information on red drum, shrimp, and other Federally managed fisheries and their EFH is provided in the 1998 amendments of the Fishery Management Plans prepared by the South Atlantic and the Mid-Atlantic Fishery Management Councils. The 1998 EFH amendments were prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 104-297).

We have also reviewed the September 1998 Draft Fish and Wildlife Coordination Act Report included with the document and concur with and support the recommendations found on pages 41-44.



Thank you for the opportunity to provide these comments. If we can be of further assistance in this matter, please advise.

Sincerely,

A handwritten signature in dark ink, appearing to read "Andreas Mager, Jr.", is written over a light gray rectangular background.

Andreas Mager, Jr.
Assistant Regional Administrator
Habitat Conservation Division

cc: FWS, ATLA, GA
FWS, Raleigh, NC
EPA, ATLA, GA
NCDENR, Raleigh, NC
NCDENR, Morehead City, NC
F/SER4



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

OCT 28 1999

Colonel James W. DeLony
District Engineer, Wilmington
P.O. Box 1890
Wilmington, NC 28402-1890

Attn: Mr. Phil Payonk
Environmental Resources Section

Subject: Environmental Assessment (EA) and Finding of No
Significant Impact (FONSI) for Proposed Navigation
Improvements to Walter Slough, Dare County, NC

Dear Colonel DeLony:

Pursuant to Section 309 of the Clean Air Act, EPA, Region 4 has reviewed the subject document, an evaluation of the environmental consequences of constructing channel upgrades along a 1.5 mile reach of Pamlico Sound from Bodie Island to Oregon Inlet Channel to Manteo. The material removed will be deposited in various locations, e.g., the ocean shoreline of Cape Hatteras National Seashore, Walter Island, or a diked disposal area near the U.S. Coast Guard Station, depending on the percentage of fines encountered. Both the initial construction and subsequent maintenance work will use a hydraulic pipeline (84,000 and 50,000 cubic yards, respectively). While dredging always has some adverse water quality impacts, in this instance if the stipulations noted in the U.S. Fish and Wildlife Coordination Report are maintained they do not appear to be unacceptable in terms of duration and/or severity.

Therefore, on the basis of the information provided in the EA we have no significant objections to its use as the evaluation model rather than the more comprehensive environmental impact statement format.

Thank you for the opportunity to comment on this action. If we can be of further assistance in this matter, Dr. Gerald Miller (404-562-9626) will serve as initial point of contact.

Sincerely,

A handwritten signature in cursive script that reads "Heinz Mueller".

Heinz J. Mueller, Chief
Office of Environmental Assessment



North Carolina
Department of Administration

James B. Hunt, Jr., Governor

Katie G. Dorsett, Secretary

October 14, 1999

Mr. Bob Finch
Dept. of the Army
Wilmington Corps of Engineers
P.O. Box 1890
Wilmington NC 28402-1890

Dear Mr. Finch:

Subject: Environmental Assessment - Proposed Navigation Improvements for Walter Slough in
Dare County

The N. C. State Clearinghouse has received the above project for intergovernmental review. This project has been assigned State Application Number 00-E-0000-0190. Please use this number with all inquiries or correspondence with this office.

Review of this project should be completed on or before 11/14/1999. Should you have any questions, please call (919)807-2425.

Sincerely,

A handwritten signature in cursive script that reads "Chrys Baggett".

Ms. Chrys Baggett
Environmental Policy Act Coordinator



North Carolina
Department of Administration

James B. Hunt, Jr., Governor

Katie G. Dorsett, Secretary

November 17, 1999

Mr. Bob Finch
Dept. of the Army
Wilmington Corps of Engineers
P.O. Box 1890
Wilmington, NC 28402-1890

Dear Mr. Finch:

Re: SCH File # 00-E-0000-0190; Environmental Assessment Proposed Navigation Improvements for
Walter Slough in Dare County

The above referenced project has been reviewed through the State Clearinghouse Intergovernmental Review Process. Attached to this letter is a request for clarification of issues raised by the N.C. Division of Water Quality. If additional information is prepared for this proposal, please resubmit it through the N.C. State Clearinghouse and we will forward it to the appropriate agency.

Should you have any questions, please do not hesitate to call me at (919) 807-2425.

Sincerely,

A handwritten signature in cursive script that reads "Chrys Baggett".

Ms. Chrys Baggett
Environmental Policy Act Coordinator

Attachments

cc: Region R
Melba McGee, NCDENR

PLEASE NOTE NEW U.S. MAIL ADDRESS
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**N.C. STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
1302 MAIL SERVICE CENTER
RALEIGH, NC 27699-1302**

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES



JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

MEMORANDUM

TO: Chrys Baggett
FROM: Melba McGee
RE: 00-0190 EA Navigation Improvements, Walter Slough,
Dare County
DATE: November 15, 1999

The Department of Environment, and Natural Resources has reviewed the proposed project.

There are several points that will need further clarification to the Division of Water Quality in order not to delay the project during final review. We encourage the applicant to directly contact Eric Fleek at 733-1786 to address his comments prior to finalizing project plans.

Thank you for your consideration.

RECEIVED

NOV 16 1999

N.C. STATE CLEARINGHOUSE



State of North Carolina
Department of Environment
and Natural Resources
Division of Water Quality

James B. Hunt, Jr., Governor
Bill Holman, Secretary
Kerr T. Stevens, Director



November 10, 1999

MEMORANDUM

To: Melba McGee
DENR Environmental Coordinator

From: Gloria Putnam *GP*
DWQ SEPA Coordinator

Subject: Comments on the Environmental Assessment for:
Navigation Improvements – Walter Slough
Dare County
US Army Corps of Engineers
DENR# 00E-0190, DWQ# 12549

The Division of Water Quality (Division) has completed its review of the US Army Corps of Engineers' Environmental Assessment (EA) for the Navigation Improvements – Walter Slough in Dare County. The Division requests that the comments below be addressed in an amended EA. If the applicant has specific questions concerning these comments, please have them contact Eric Fleek of the Division's 401 Wetland Group at 919-733-9604. For other questions and routing of responses, please have them contact me at 919-733-5083, ext. 567.

Thank you for the opportunity to comment.

Comments

1. The EA notes that "the location of known submerged grassbeds were mapped between 1990 and 1996." As SAV is capable of drastic expansion and contraction of establishment on a year to year basis, an additional SAV survey in the project area needs to be conducted to determine the present and potential impacts on SAV (both direct and indirect). This is especially important in regards to the undisturbed 30' buffer from the edge of the channel to SAV beds adjacent to the channel.

2. The EA notes that a mitigation plan, which would result in no net loss of SAV, will be developed and implemented. Please elaborate on what this plan would be comprised of and how it would be implemented if its employment were necessary due to SAV impacts.
3. The EA extensively notes the organisms that may or may not be affected by the proposed project. However, there seemed to be no discussion regarding the presence or absence of shellfish resources within the project boundaries. Please provide this information in the amended EA. If significant shellfish resources are present, as defined by the NC Division of Marine Fisheries (NCDMF), then these areas may need to be avoided or resources may need to be relocated to suitable habitat pre-approved by NCDMF.
4. Please provide additional information regarding the length of beach that will receive spoil versus the length of adjacent beach that will not receive spoil. In general, please elaborate on the beach disposal plan.

cc: Eric Fleek, Wetlands Group



North Carolina
Department of Administration

James B. Hunt, Jr., Governor

Katie G. Dorsett, Secretary

November 17, 1999

Mr. Bob Finch
Dept. of the Army
Wilmington Corps of Engineers
P.O. Box 1890
Wilmington, NC 28402-1890

Dear Mr. Finch:

Re: SCH File # 00-E-0000-0190; Environmental Assessment Proposed Navigation Improvements for
Walter Slough in Dare County

The above referenced project has been reviewed through the State Clearinghouse Intergovernmental Review Process. Attached to this letter is a request for clarification of issues raised by the N.C. Division of Water Quality. If additional information is prepared for this proposal, please resubmit it through the N.C. State Clearinghouse and we will forward it to the appropriate agency.

Should you have any questions, please do not hesitate to call me at (919) 807-2425.

Sincerely,

A handwritten signature in cursive script that reads "Chrys Baggett".

Ms. Chrys Baggett
Environmental Policy Act Coordinator

Attachments

cc: Region R
Melba McGee, NCDENR

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NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

MEMORANDUM

To: Chrys Baggett
State Clearing House

From: Melba McGee *MM*
Environmental Review Coordinator

Re: #00E-0190, Section 107 Draft Detailed Project Report and EA- Walter
Slough, Dare County.

Date: November 17, 1999

The attached comments were received by this office after the response due date. These comments should be forwarded to the applicant and made a part of our previous comment package.

Thank you for the opportunity to respond.

MM:sh

Attachment

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NOV 17 1999

N.C. STATE CLEARINGHOUSE



Division of Environmental Health

Notify Shellfish Sanitation prior to dredging from a closed area with disposal to an open area. Beach disposal between the months of May and October would require warning signs to be posted.

Gina Brooks
Shellfish Sanitation



North Carolina
Department of Administration

James B. Hunt, Jr., Governor

Katie G. Dorsett, Secretary

December 3, 1999

Mr. Bob Finch
Dept. of the Army
Wilmington Corps of Engineers
P.O. Box 1890
Wilmington, NC 28402-1890

Dear Mr. Finch:

Re: SCH File # 00-E-0000-0190, Environmental Assessment Proposed Navigation Improvements for
Walter Slough in Dare County

The above referenced project has been reviewed through the State Clearinghouse Intergovernmental Review Process. Attached to this letter are *ADDITIONAL* comments made by agencies reviewing this document.

Should you have any questions, please do not hesitate to call me at (919) 807-2425.

Sincerely,

A handwritten signature in cursive script that reads "Chrys Baggett".

Ms. Chrys Baggett
Environmental Policy Act Coordinator

Attachments

cc: Region R



NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES



MEMORANDUM

JAMES B. HUNT JR.
GOVERNOR

To: Chrys Baggett
State Clearing House

BILL HOLMAN
SECRETARY

From: Melba McGee *mm*
Environmental Review Coordinator

Re: #00E-0190 Draft Detailed Project Report and EA – Walter Slough
Channel Project, Dare County.

Date: November 30, 1999

The attached comments were received by this office after the response due date. These comments should be forwarded to the applicant and made a part of our previous comment package.

Thank you for the opportunity to respond.

MM:sh

Attachment

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DEC 2 1999

N.C. STATE CLEARINGHOUSE





NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF COASTAL MANAGEMENT

MEMORANDUM

TO: Melba McGee, NC Division of Policy and Development
FROM: Steve Benton, NC Division of Coastal Management
SUBJECT: Review of SCH#

DATE: 11-23-99

☒ A COPY OF ALL COMMENTS RECEIVED
BY THE SCH IS REQUESTED

☒ REVIEWER COMMENTS
ATTACHED

Review Comments:

___ This document is being reviewed for consistency with the NC Coastal Management Program pursuant to federal law and or NC Executive Order 15. Agency comments received by SCH are needed to develop the State's consistency position.

Project Review Number (if different from above) _____

A consistency position will be developed based upon our review on or before _____.

☒ A Consistency Determination document ☒ is, or ___ may be required for this project pursuant to federal law and or NC Executive Order 15. Applicant should contact Steve Benton or Caroline Bellis in Raleigh, phone (919)733-2293, for information on proper document format and applicable state guidelines and land use plan policies.

☒ Proposal is in draft form, a consistency response is inappropriate at this time. A Consistency Determination should be included in the final document.

___ A Consistency Determination Document (pursuant to federal law and/or NC Executive Order 15) is not required.

___ A consistency response has already been issued.

Project Number _____ Date Issued _____

___ Proposal involves < 20 Acres and or a structure < 60,000 Square Feet and no AEC's or Land Use Plan problems.

___ Proposal is not in the Coastal Area and will have no significant impacts on any land or water use or natural resources of the Coastal Area.

___ A CAMA Permit ___ is, or ___ may be required for all or part of this project. Applicant should contact _____ in _____, phone # _____, for information.

___ A CAMA Permit ___ has already been issued, or ___ is currently being reviewed under separate circulation. Permit Number _____ Date Issued _____

☒ Other (see attached).

State of North Carolina Consistency Position:

___ The proposal is consistent with the NC Coastal Management Program provided that all conditions are adhered to and that all state authorization and/or permit requirements are met prior to implementation of the project.

___ The proposal is inconsistent with the NC Coastal Management Program.

___ Other (see attached).

1638 MAIL SERVICE CENTER, RALEIGH, NC 27699-1638
2728 CAPITAL BLVD., RALEIGH, NC 27604
PHONE 919-733-2293 FAX 919-733-1495

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JAMES B. HUNT JR.
GOVERNOR

WAYNE MCDEVITT
SECRETARY

DONNA D. MOFFITT
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF COASTAL MANAGEMENT



JAMES B. HUNT JR.
GOVERNOR

WAYNE MCDEVITT
SECRETARY

DONNA D. MOFFITT
DIRECTOR

TO: Steve Benton

THROUGH: Charles S. Jones

FROM: Lynn W. Mathis *Lin*

SUBJECT: Review of USCOE Draft Detailed Project Report and Environmental Assessment Walter Slough, Dare County

DATE: November 15, 1999

RE

NO

COASTAL MANAGEMENT

SE 400-0190

Based on my review of the Environmental Assessment for navigation improvements to the 1.5 mile access channel at Walter Slough near Oregon Inlet, and I would like to offer the following comments:

The project involves designating Walter Slough as a federally authorized channel, and establishing a 50-year maintenance plan that will result in the dredging of approximately 600,000 cubic yards of material over the life of the project. Dredging will occur at four year intervals and utilize three spoil sites: 1) an existing spoil island adjacent to the channel (Island D), 2) an upland site immediately north of the Coast Guard Station and the Oregon Inlet Fishing Center (OIFC), and; 3) the ocean beach along Cape Hatteras National Seashore.

The OIFC is a major sport fishing center that provides access to the sound for the US Coast Guard, charter boats, commercial fishing boats, and thousands of smaller boats using the public launching facility. In addition the site provides a ships store a pumping station, bathroom facilities and overnight dockage. The channel and basin have a history of maintenance, including dredging for an emergency ferry dock in 1990.

My initial review of the project, in October 1998, raised several questions (See Attached), most of which have been addressed. The current proposal appears to reduce the original project impacts, but does not: 1) commit to the recommended time for the work to be accomplished, and; 2) confined spoil on Island D above normal water level. While the Division strongly supports implementation of the U. S. Fish and Wildlife Service recommendations, submitted as a part of the overall document and found on pages 41 and 43 of the Environmental Assessment, I would like to offer the following:

- 1) Dredge spoil placed on existing the spoil island (Island D) should be confined landward of normal water level to prevent entry of sediments into the sound.

ELIZABETH CITY OFFICE
1367 U.S. 17 SOUTH ELIZABETH CITY, NC 27909
PHONE 252-264-3901 FAX 252-264-3723

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- 2) Dredging should occur between February 1st and October 31st.
- 3) Should spoil from the project be found compatible for placement on the beach, it should occur between November 15th and May 1st (outside of the established moratorium for nesting sea turtles).
- 4) The entire 1.5 mile channel between the OIFC and Old House Channel should be limited to a bottom with not to exceed 60' and a depth of 8' at mean low water.

No permits are required through the Division of Coastal Management for Federal Projects.

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF COASTAL MANAGEMENT



JAMES B. HUNT JR.
GOVERNOR

WAYNE MCDEVITT
SECRETARY

DONNA D. MOFFITT
DIRECTOR

October 29, 1998

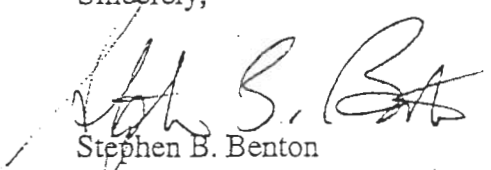
Mr. John M. Hefner
Ecological Services Supervisor
US Fish and Wildlife Service
P.O. Box 33726
Raleigh, NC 27636-3726

Dear Mr. Hefner:

Attached, please find copies of comments received during our review of the Draft Fish and Wildlife Coordination Act Report for the Walter Slough Dredging Project being proposed by the US Army Corps of Engineers. Please also note that the Corps will be required to submit a Consistency Determination for this project pursuant to 15 CFR 930 Subpart B, Consistency for Federal Activities.

We hope that these comments are helpful in preparing your Final Report. Please call me or Ms. Caroline Bellis if you have any questions. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,


Stephen B. Benton
Consistency Coordinator

cc: Terry Moore, Division of Coastal Management, Elizabeth City
William Wescott, Wildlife Resources Commission
Coleman Long, US Army Corps of Engineers

State of North Carolina
Department of Environment
and Natural Resources
Division of Marine Fisheries

James B. Hunt, Jr., Governor
Wayne McDevitt, Secretary
Preston P. Pate, Jr., Director



MEMORANDUM:

TO: Steve Benton, DCM Consistency Coordinator

THROUGH: P. A. Wojciechowski, Permit Review Coordinator

FROM: Sara E. Winslow, Biologist Supervisor *SEW*

SUBJECT: Project Number - DCM98-41 - USFWS Draft FWCA Report Walter Slough Channel Project

DATE: September 29, 1998

The North Carolina Division of Marine Fisheries has reviewed the U.S. Fish and Wildlife Service report and supports the recommendations for incorporation into project plans.

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF COASTAL MANAGEMENT

TO: Steve Benton

THROUGH: Terry E. Moore

FROM: Lynn W. Mathis *LW*

SUBJECT: Review of USFWS Draft FWCA Report Walter Slough Channel Project
in Dare County

DATE: October 27, 1998

I have reviewed the above noted document and would like to offer the following summary comments:

Based on the material submitted, it is my understanding that the U. S. Army Corps of Engineers proposes to maintenance dredge Walter Slough Channel north west of Oregon Inlet in Dare County. The channel provides access for the Coast Guard and Oregon Inlet Fishing Center (OIFC). Approximately 40 commercial charter boats operate out of the center and use the channel.

In 1985 the U. S. Coast Guard dredged the channel in Walter's Slough in 1985, to a depth 7' below mean low water with a width of 50'. Aerial photographs for 1984, 1989 and 1995 indicate that some maintenance may have occurred within the channel. In 1996 the Division of Water Resources requested authorization to emergency side-cast dredge a shoal in the slough. The request was opposed by the U. S. Fish and Wildlife Service and National Marine Fisheries, resulting no authorization being granted.

I agree with the recommendations found in Section 13 of the report and would like to add the following:

- 1) The current request will include the entire 1.5 mile channel between the OIFC and Old House Channel, and have a bottom width of 60' and a depth of 9' at mean low water, and subject to change (according to the report). Any expansion of the previously maintained channel must avoid significant loss of submerged aquatic vegetation.
- 2) The location of the channel must remain within the existing channel. Any excavation of a new channel will fall under SEPA.
- 3) The specific method for dredging has not been established. The alternatives include using a side-caster or hydraulic dredge. Previous permit requests to sidecast dredge in this area have resulted in strong objections, and as pointed out in the report simply deposits the material to an adjacent location. Sidecast dredging results in a greater amount of suspended solids in the water column than that produced from hydraulic dredging. I would recommend that sidecast dredging not be used in conjunction with the project.
- 4) The exact location of the spoil disposal sites have not been established. Spoil material from the project may be deposited on the beach or spoil islands. Before placing any spoil on the beach front, sand grain size and type should be verified as compatible with existing beach material. When the Department of Transportation considered sources for sand for

ELIZABETH CITY OFFICE
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constructing dunes along NC 12 (following the removal of the sandbags), spoil sand found in some areas west of the Herbert C. Bonner Bridge was not considered compatible for beach disposal.

- 5) Should the disposal of spoil involve the creation or expansion of a spoil island, resulting in the creation of high ground, the project may fall under SEPA.
- 6) It should be noted that in accordance with NCAC 07H .0208 (b)(2)(H) dredge spoil from closed shellfishing waters, as well as the effluent from dikes spoil sites, must be returned to the closed shellfishing waters. The waters north of the bridge are currently closed and may preclude beach disposal.
- 7) Finally, should the material be found compatible for beach nourishment and placement permitted, it must be timed for placement between November 15th and May 1st (outside the established moratorium for nesting sea turtles).
- 8) The use of spoil islands will meet the requirements noted in #5 above, but placement should also be timed to reduce the disruption of nesting birds. In addition, retention of the material to reduce turbidity within the project area is important.
- 9) The key to this project, as noted in the report, is minimization.
- 10) Prior to making and determination regarding the specific project, the scope must be refined. Specific data upon which to base concrete recommendations is necessary. This will be accomplished through CAMA Major Permit will be required.



North Carolina
Department of Administration

James B. Hunt, Jr., Governor

Katie G. Dorsett, Secretary

December 13, 1999

Mr. Bob Finch
Dept. of the Army
Wilmington Corps of Engineers
P.O. Box 1890
Wilmington, NC 28402-1890

Dear Mr. Finch:

Re: SCH File # 00-E-0000-0190; Environmental Assessment Proposed Navigation Improvements for
Walter Slough in Dare County

The above referenced project has been reviewed through the State Clearinghouse Intergovernmental Review Process. Attached to this letter are *additional* comments made by agencies reviewing this document which were received after the original response due date. Please make these comments part of your previous comment package.

Should you have any questions, please do not hesitate to call me at (919) 807-2425.

Sincerely,

A handwritten signature in cursive script that reads "Chrys Baggett".

Ms. Chrys Baggett
Environmental Policy Act Coordinator

Attachments

cc: Region R

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES



MEMORANDUM

JAMES B. HUNT JR.
GOVERNOR

To: Chrys Baggett
State Clearing House

BILL HOLMAN
SECRETARY

From: Melba McGee *MM*
Environmental Review Coordinator

Re: #00E-0190 Walter Slough Draft EA, Dare County.

Date: December 9, 1999

The attached comments were received by this office after the response due date. These comments should be forwarded to the applicant and made a part of our previous comment package.

Thank you for the opportunity to respond.

MM:sh

Attachment

RECEIVED

DEC 10 1999

N.C. STATE CLEARINGHOUSE



DIVISION OF WATER QUALITY
GROUNDWATER SECTION

MEMORANDUM

TO: Kathy Ford, Office Work Unit Supervisor
Washington Regional Office

THROUGH: *W.H.* Willie Hardison, Regional Groundwater Supervisor
Washington Regional Office

FROM: *C.J.W.* Conrad J. Welti, L.G., Hydrogeologist I
Washington Regional Office

DATE: November 8, 1999

SUBJECT: 00E-0190 (Walter Slough Draft E.A. - Dare County)

The Groundwater Section has reviewed the above proposal and has determined that this project should not have any adverse impact upon groundwater supply. However, the following comment (s) are pertinent to our review:

- 1) As a result of this project, any chemical or petroleum spills that occur of significant quantity must be reported to the Division of Water Quality in the Washington Regional Office (252-946-6481).
- 2) Prior to commencing dredging in the Oregon Inlet Fishing Center (OIFC) sediment samples should be collected from the marina area and analyzed for potential contaminants generally associated with boat operations and maintenance (petroleum & heavy metals).

Should you have any questions regarding the above comments, please don't hesitate to ask.



COUNTY OF DARE

MANTEO, NORTH CAROLINA 27954

November 14, 1999

Action: TS
CF: DE
DD
DX
DP

P. O. BOX 1000
PHONE (919) 473-1101

Colonel James W. DeLony
Department of the Army
Wilmington District, Corps of Engineers
Post Office Box 1890
Wilmington, NC 28402-1890

Dear Colonel DeLoney:

On behalf of the people of Dare County, please allow me to express my support for efforts by the Corps of Engineers to include Walter Slough near Oregon Inlet on the regular maintenance dredging schedule.

Walter Slough is very important to the people of eastern North Carolina. It serves as an important link between the Oregon Inlet Fishing Center and Oregon Inlet Coast Guard Station with other federally maintained channels in the Pamlico, Croatan, and Roanoke Sounds. If Walter Slough becomes impassable, the charter fleet that operates out of the Oregon Inlet Fishing Center will be trapped in the Fishing Center basin, unable to operate. In addition, the Coast Guard will not be able to perform its search and rescue duties in the area in a timely fashion.

In the Project Report and Environmental Assessment just released, the Corps of Engineers explains its plans to deepen Walter Slough to a depth of 7 feet and a width of 60 feet in the hope of ensuring proper navigation through the waterway. A four-year cycle of maintenance is also proposed. On behalf of the people of Dare County, we support the inclusion of Walter Slough to the regular maintenance schedule. A channel 7 feet depth (with two feet of overdepth) should allow navigation by area vessels. Sixty feet should be wide enough to allow passing by members of the fleet.

The major concern of my people with the proposal is the 4 year timetable chosen for maintenance. Walter Slough has a history of shoaling problems that tend to occur every couple of years. A 4-year cycle may not allow dredging as often as needed. Therefore, we would respectfully request dredging be done on a two year cycle. At the very least, the Corps needs to be ready to do emergency dredging when and if the channel becomes too shallow in the years when no regular maintenance dredging is scheduled.

Thank you again for considering Walter Slough for the regular maintenance schedule. For the safety of boaters in eastern North Carolina, the channel needs to be maintained on a regular basis. If I can provide you with further information on this matter, please do not hesitate to contact me.

Sincerely,

Gilbert R. "Moon" Tillett
Chairman
Dare County Oregon Inlet
and Waterways Commission

GRMT:meh

LAND OF BEGINNINGS

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APPENDIX C

Essential Fish Habitat (EFH) Assessment

Essential Fish Habitat

The 1996 Congressional amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (PL 94-265) set forth new requirements for the National Marine Fisheries Service (NMFS), Regional Fishery Management Councils (FMCs), and other Federal agencies to identify and protect important marine and anadromous fish habitat. These amendments established procedures for the identification of Essential Fish Habitat (EFH) and a requirement for interagency coordination to further the conservation of federally managed fisheries. The project area may include species that are managed by, or are of particular interest to the Mid-Atlantic and South Atlantic Fishery Management Councils, as well as the Atlantic States Marine Fisheries Commission. The NMFS Southeast Region is the point of contact (POC) for EFH coordination for this project. This assessment will be coordinated with the NMFS Southeast Region. Additional copies of the report will be provided to the POC for distribution to other fishery councils upon their request.

The proposed action and the environmental impacts of the proposed action were addressed in the Section 107 Draft Detailed Project Report and Environmental Assessment, Walter Slough, Dare County, North Carolina, (DPR and EA) dated August 1999. The EA was circulated Federal State, and local agencies and the public in October 1999. As a result of comments made during the public comment period, the project plan has been changed from that presented in the EA. The changes principally involve the dredged material disposal aspects of the plan. The placement of dredged material on the beaches of the Cape Hatteras National Seashore is no longer a part of the project plan.

Walter Slough Channel extends from the Outer Banks of North Carolina southwesterly about 1.5 miles into Pamlico Sound. Two separate boat basins are located at the northeastern end of Walter Slough or the west side of Bodie Island. One basin contains a United States Coast Guard (USCG) station and a public boat ramp. The other basin is called the Oregon Inlet Fishing Center (OIFC). The OIFC is owned by the National Park Service and operated by a concessionaire. It is a major sport fishing facility that provides fuel, bait, ice, water, tackle, fish cleaning services, electricity, overnight docking, fish weighing, photography, and a marine toilet dump station. Walter Slough Channel provides water access from the OIFC to maintained channels in Pamlico Sound. These interconnected channels provide access to Roanoke, Croatan, and Albemarle Sounds, as well as the Atlantic Ocean. The Walter Slough Navigation Channel Project is being conducted under the authority of Section 107 of the Rivers and Harbors Act of 1960, as amended.

Channel Plan. The Walter Slough Navigation Channel Plan includes construction and maintenance of dimensions adequate to accommodate resident and transient vessels traveling to and from the OIFC. The proposed channel alignment takes advantage of the existing path of deepest water to Pamlico Sound, appears to be the most direct and cost effective. The total length of a channel on this alignment is about 7,900 feet. The channel dimensions are considered the minimum necessary for navigation on open water

during periods of darkness and inclement weather. The proposed channel depth is 7 feet plus two feet of overdepth by 60 feet bottom width.

Dredged Material Disposal. Construction of the proposed channel would result in the disposal of 84,000 cubic yards of dredged material. Normal maintenance of this channel would result in the disposal of about 50,000 cubic yards of dredged material every 4 years. A total of 684,000 (84,000 initially plus 50,000 by 12 cycles) cubic yards of dredged material would be removed over the 50-year life of the project. Project construction and maintenance will be accomplished by hydraulic pipeline dredge. The current plan is to place dredged material on Island D. The placement of Walter Slough Channel dredged material on beaches of Cape Hatteras National Seashore or within the small, diked disposal adjacent to the Oregon Inlet Coast Guard Station has been deleted as a project feature.

Available upland disposal site are limited in the project vicinity due to other on-going dredging projects in the area.

Island D is the proposed dredged material disposal area. Island D is located just to the west of the confluence of Walter Slough and the Oregon Inlet Channel to Manteo. Island D is the closest disposal island to Walter Slough. Disposal of dredged material would require pumping it to this island and placing the material using the control-of-effluent method of disposal to guide where sand accretion occurs. This technique has been used for previous Walter Slough dredging events. The control-of-effluent method of disposal involves pumping dredged material to the highest point on an unconfined disposal island and allowing it to naturally flow down the slopes of the island. The direction of effluent on the island would be to the channel side of the island (east side) to protect aquatic resources on the non-channel side (west side) (i.e. wetland fringes, submerged aquatic vegetation (SAV) and shallow water habitat). Control berms will be used if necessary to confined dredged material and control the movement of sediment into the water.

The placement of dredged material from future Walter Slough channel maintenance dredging events will physically change the island. The most noticeable change may be an increase in the size of the island. The increase in size of the island will depend to a large degree on the height to which the material is stacked. The higher the island is made the less area will be taken up and the potential for adverse impacts on aquatic resources is reduced. However, island height adversely affects use of the island by colonial water birds. For the project area around Island D, the effluent will be controlled using berms towards the deeper water, the Manteo to Oregon Inlet Channel and east side of Island D. The goal of the disposal island management will be to provide dredged material disposal in balance waterbird use of the island and minimized changes in SAV habitat on the opposite or west side of the island. To accomplish this management plan, aerial photographs of the Island will be digitized before and after each Walter Slough disposal event to determine basic changes the Island and adjacent habitats directly attributable to the Walter Slough project. This information will be coordinated with the stakeholder agencies such as FWS, NMFS, NPS, NCDENR (Department of Environment and Natural Resources), and NCWRC (Wildlife Resources Commission). Appropriate mitigation will

be implemented following agency coordination. The goal of the mitigation will be no net loss of SAV habitat attributable to the Walter Slough project. Some minor no net loss changes in size and shape of SAV habitat polygons attributable to natural fluctuations are acceptable.

Table 1 lists by life stages, 15 species which may occur in the vicinity of Walter Slough and which are managed under MSFCMA. These fish species and habitats require special consideration to promote their viability and sustainability. The potential impacts of the proposed actions on these fish and habitats are discussed the following paragraphs.

Table 1. Fish species managed under MSFCMA that may occur in the project vicinity.

FISH SPECIES	LIFE STAGES PRESENT	
	Roanoke Sound	Pamlico Sound
Red drum	E L J A	E L J A
Bluefish	E L J A	E L J A
Summer flounder	L J A	L J A
Gag grouper	J	J
Gray snapper	J	J
Cobia	E L J A	E L J A
King mackerel	J A	J A
Spanish mackerel	J A	J A
Black sea bass	L J A	L J A
Spiny dogfish	J A	E L J A
Brown shrimp	E L J A	E L J A
Pink shrimp	E L J A	E L J A
White shrimp	E L J A	E L J A
Sandbar shark	N/A	J A
Sheepshead	N/A	J A
LIFE STAGES PRESENT: E=Egg L=Larvae J=Juvenile A=Adult		

Table 2 shows the categories of EFH and Habitat Areas of Particular Concern (HAPC) for managed species which were identified in the Fishery Management Plan Amendments and which may occur in the project area. Essential Fish Habitats identified in the Final Habitat Plan for the South Atlantic Region that may occur in the project area include; the estuarine water column, aquatic beds, estuarine emergent wetlands, oyster reefs and shellbanks, palustrine forested wetlands, seagrass (submerged aquatic vegetation) and state-designated areas of importance for managed species (primary nursery areas).

Table 2: Categories of Essential Fish Habitat and Habitat Areas of Particular Concern in Southeast States.¹

ESSENTIAL FISH HABITAT	GEOGRAPHICALLY DEFINED HABITAT AREAS OF PARTICULAR CONCERN
<u>Estuarine Areas</u>	<u>Area – Wide</u>
Aquatic Beds	Council-designated Artificial Reef Special Management Zones
Estuarine Emergent Wetlands	Hermatypic (reef-forming) Coral Habitat & Reefs
Estuarine Scrub / Shrub Mangroves	Hard Bottoms
Estuarine Water Column	Hoyt Hills
Intertidal Flats	Sargassum Habitat
Oyster Reefs & Shell Banks	State-designated Areas of Importance of Managed Species
Palustrine Emergent & Forested Wetlands	Submerged Aquatic Vegetation
Seagrass	
	<u>North Carolina</u>
<u>Marine Areas</u>	
Artificial / Manmade Reefs	Big Rock
Coral & Coral Reefs	Bogue Sound
Live / Hard Bottoms	Capes Fear, Lookout, & Hatteras (sandy shoals)
Sargassum	New River
Water Column	The Ten Fathom Ledge
	The Point

¹Areas shown are identified in Fishery Management Plan Amendments of the South Atlantic Fishery Management Council and are included in Essential Fish Habitat: New Marine Fish Habitat Mandate for Federal Agencies. February 1999. (Tables 6 and 7)

Impacts on Managed Species. There will be an increase in turbidity in the immediate area of dredging. Turbidity and localized disturbance associated with dredging and dredged material disposal may cause the temporary displacement of these and other species of fish. Some fish may be attracted by the bottom disturbance. The turbidity levels produced are not expected to result in adverse effects on managed species. Most of these species are highly mobile and should be able to avoid harm; however, some slow moving animals may be lost to the hydraulic pipeline. The dredging would be conducted during September 1 to March 31 to minimize impacts to estuarine organisms. Any direct mortality would be low and expected to be insignificant.

Impacts on Essential Fish Habitats. The Fishery Management Plan Amendments of the South Atlantic Fishery Management Council identify a number of categories of Essential

Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC), which are listed in Table 2. While all 26 of these habitat categories occur in waters of the southeastern United States, many are absent from the project vicinity. Those absent include estuarine scrub/shrub mangroves which require a more tropical environment and several areas that are geographically removed from the project area including: Hoyt Hills located in the Blake Plateau area in water 450-600 meters deep, Cape Fear Sandy Shoals also known as Frying Pan Shoals, Big Rock and Ten-Fathom Ledge located off Cape Lookout, Hatteras Sandy Shoals, New River, and Bogue Sound. In addition, this project will not impact marine (ocean) areas.

Impacts on habitat categories potentially present in the project vicinity are discussed below. They included; estuarine water column, aquatic beds, estuarine emergent wetlands, oyster reefs and shellbanks, seagrass (submerged aquatic vegetation) and state-designated areas of importance for managed species (primary nursery areas).

Estuarine Water Column. The potential water quality impacts of placement of fill material for this project are addressed in Section 7.1 of the August 1999 EA. The dredging and control of effluent disposal on Island D may create impacts in the estuarine water column in the immediate vicinity of the activity, potentially affecting estuarine fish and adjacent habitat. These impacts may include minor and short-term suspended sediment plumes and related turbidity, as well as the release of soluble trace constituents from the sediment. Turbidity increases outside the immediate dredging and disposal area should be less than 25 NTUs and are, therefore, considered insignificant. Overall water quality impacts of the proposed action are expected to be short-term and minor. Living estuarine resources dependent upon good water quality are not expected to experience significant adverse impacts due to water quality changes.

Impacts to Aquatic Beds. Aquatic beds, such as clam beds are present in the project area. However, the Walter Slough Channel will follow the existing channel and deep water to connect with Old House Channel. The proposed dredging and disposal on Island D will protect existing aquatic beds to the maximum extent practicable. Sediment will be removed by hydraulic pipeline dredge and the material placed on Island D using control of effluent methods directed towards the channel (east side of Island D). Control berms will be used to retain sediment on the island and direct runoff towards the Oregon Inlet Channel to Manteo and away from aquatic habitats on the other side of Island D.

Impacts to Emergent and Forested Wetlands and Seagrass. Seagrasses (an Estuarine Habitat Area of Particular Concern (HAPOC)) are present in the project area. These areas are important to estuarine vitality and serve as important nursery areas for many fish species. The proposed dredging and disposal on Island D will protect existing seagrass habitat to the maximum extent practicable. Sediment will be removed by hydraulic pipeline dredge and the material placed on Island D using control of effluent methods directed towards the channel (east side of Island D). Control berms will be used to retain sediment on the island and direct runoff towards the Oregon Inlet Channel to Manteo and away from the SAV areas on the other side of Island D. Emergent Wetland will not be affected by the Walter Slough project.

Impacts on Oyster reefs and shell banks. The proposed Walter Slough channel follows the previously dredged channel alignment. Oyster reefs and shell banks will not be adversely affected by the proposed Walter Slough channel which follows the existing alignment. Oyster harvest areas and oyster management areas near Roanoke Island and southwest of Oregon Inlet will not be adversely affected by dredging the proposed Walter Slough channel.

Impacts on State-Designated Areas Important for Managed Species. Primary Nursery Areas (PNAs) are designated by the North Carolina Marine Fisheries Commission and are defined by the State of North Carolina as tidal saltwater, which provide essential habitat for the early development of commercially important fish and shellfish (15 NC Administrative Code 3B .1405). Many fish species undergo initial post-larval development in these areas. Walter Slough project area is not designated as primary nursery, however, the SAVs in the area are known to provide nursery habitat to many species.

Impact Summary for Essential Fish Habitat. The proposed action is not expected to cause any significant adverse impacts to Essential Fish Habitat or EFH species.

APPENDIX D

EVALAUTION OF SECTION 404(b)(1) GUIDELINES

WALTER SLOUGH CHANNEL

Dare County, North Carolina

Evaluation of Section 404 (b) (1) Guidelines, 40 CFR 230

This evaluation covers the placement of all fill material into waters and wetlands of the United States required for construction of the Walter Slough Channel, Dare County, North Carolina

Section 404 Public Notice No. CESA-W-TS-PE-99-28-0007

- | | Preliminary 1/ | Final 2/ |
|--|--|---|
| 1. <u>Review of Compliance (230.10(a)-(d))</u>
A review of the NEPA Document indicates that: | | |
| a. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose (if no, see section 2 and NEPA document); | YES <input type="checkbox"/> NO <input type="checkbox"/> | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> |
| b. The activity does not:
1) violate applicable State water quality standards or effluent standards prohibited under Section 307 of the CWA; 2) jeopardize the existence of federally listed endangered or threatened species or their habitat; and 3) violate requirements of any federally designated marine sanctuary (if no, see section 2b and check responses from resource and water quality certifying agencies); | YES <input type="checkbox"/> NO <input type="checkbox"/> * | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> |
| c. The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values (if no, see section 2); | YES <input type="checkbox"/> NO <input type="checkbox"/> | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> |
| d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see section 5). | YES <input type="checkbox"/> NO <input type="checkbox"/> * | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> |

Proceed to Section 2

*, 1, 2/ See page 6.

3. Evaluation of Dredged or Fill Material (Subpart G) 3/

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate.)

- (1) Physical characteristics. ☒
- (2) Hydrography in relation to known or anticipated sources of contaminants ☒
- (3) Results from previous testing of the material or similar material in the vicinity of the project ☒
- (4) Known, significant sources of persistent pesticides from land runoff or percolation ☐
- (5) Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances ☐
- (6) Other public records of significant introduction of contaminants from industries, municipalities, or other sources. ☐
- (7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities. ☐
- (8) Other sources (specify). ☒

List appropriate references.

Reference: FONSI, Appendix A, Walter Slough Channel, Dare County, North Carolina, dated August 2001.

b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and disposal sites and not likely to result in degradation of the disposal site.**

YES ☒ NO ☐

Proceed to Section 4

*, 3/, see page 6.

4. Disposal Site Determinations (230.11(f)).

a. The following factors as appropriate,
have been considered in evaluating the
disposal site.

- (1) Depth of water at disposal site. ☒
- (2) Current velocity, direction, and
variability at disposal site ☒
- (3) Degree of turbulence. ☒
- (4) Water column stratification ☒
- (5) Discharge vessel speed and direction ☒
- (6) Rate of discharge ☒
- (7) Dredged material characteristics
(constituents, amount and type
of material, settling velocities). ☒
- (8) Number of discharges per unit of
time. ☒
- (9) Other factors affecting rates and
patterns of mixing (specify)

List appropriate references.

Reference: EA and FONSI , Walter Slough Channel, Dare County, North Carolina, dated August 2000 and August 2001.

b. An evaluation of the appropriate factors in
4a above indicates that the disposal site
and/or size of mixing zone are acceptable.

YES ☒ NO ☐*

5. Actions to Minimize Adverse Effects (Subpart H).

All appropriate and practicable steps have been taken,
through application of recommendations of 230.70-230.77,
to ensure minimal adverse effects of the proposed
discharge. List actions taken.

YES ☒ NO ☐*

See FONSI , Walter Slough Channel, Dare County, North Carolina, dated August 2001 for actions taken.

Return to section 1 for final stage of compliance review. See also
note 3/, page 3.

*See page 6.

6. Factual Determinations (230.11).

A review of appropriate information as identified in items 2-5 above indicates that there is minimal potential for short- or long-term environmental effects of the proposed discharge as related to:

- | | |
|---|---|
| a. Physical substrate at the disposal site
(review sections 2a, 3, 4, and 5). | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> * |
| b. Water circulation, fluctuation, and salinity
(review sections 2a, 3, 4, and 5). | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> * |
| c. Suspended particulates/turbidity
(review sections 2a, 3, 4, and 5). | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> * |
| d. Contaminant availability
(review sections 2a, 3, and 4). | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> * |
| e. Aquatic ecosystem structure and function
(review sections 2b and c, 3, and 5). | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> * |
| f. Disposal site
(review sections 2, 4, and 5). | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> * |
| g. Cumulative impact on the aquatic
ecosystem. | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> * |
| h. Secondary impacts on the aquatic
ecosystem. | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> * |

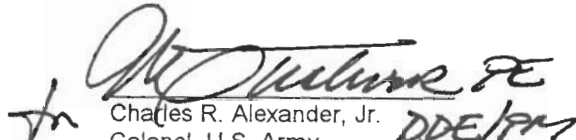
7. Findings.

- a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines. ☒
- b. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines with the inclusion of the following conditions: ☐
- c. The proposed disposal site for discharge of dredged or fill material does not comply with the Section 404(b)(1) guidelines for the following reasons(s):
- (1) There is a less damaging practicable alternative ☐
- (2) The proposed discharge will result in significant degradation of the aquatic ecosystem ☐

*See page 6.

- (3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem. ☐

8.


Charles R. Alexander, Jr.
Colonel, U.S. Army
District Engineer

W. Eugene Tickner
Acting Commander

Date: 25 June 02

*A negative, significant, or unknown response indicates that the permit application may not be in compliance with the Section 404(b)(1) Guidelines.

1/ Negative responses to three or more of the compliance criteria at this stage indicate that the proposed projects may not be evaluated using this "short form procedure." Care should be used in assessing pertinent portions of the technical information of items 2 a-d, before completing the final review of compliance.

2/ Negative response to one of the compliance criteria at this stage indicates that the proposed project does not comply with the guidelines. If the economics of navigation and anchorage of Section 404(b)(2) are to be evaluated in the decision-making process, the "short form evaluation process is inappropriate."

3/ If the dredged or fill material cannot be excluded from individual testing, the "short-form" evaluation process is inappropriate.

APPENDIX E

**WALTER SLOUGH CHANNEL PROJECT
DARE COUNTY, NORTH CAROLINA
FINAL FISH AND WILDLIFE COORDINATION ACT REPORT**



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

Routed: 27 Dec 01
Action: TS
CF: DP
PM
OP

December 19, 2001

Colonel James W. DeLony
District Engineer
U.S. Army Corps of Engineers
Post Office Box 1890
Wilmington, North Carolina 28402-1890

Attention: Coleman Long and Phil Payonk

Dear Colonel DeLony:

In accordance with our Transfer Funding Agreement and Scope of Work for FY 2002, the U. S. Fish and Wildlife Service (Service) has enclosed two copies of our Final Fish and Wildlife Coordination Act (FWCA) Report for the Walter Slough Channel Project, Dare County, North Carolina. This report identifies fish and wildlife resources in the project area; provides our assessment of project impacts on these resources; and lists the Service's recommendations for avoiding, minimizing, and compensating for impacts on these resources. This constitutes the Service's report in accordance with Section 2(b) of the FWCA (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

The Service's Draft FWCA Report of September 1998 was provided to the appropriate state and federal agencies for their review and comments. Aspects of this report, especially the use of dredged material to benefit colonial nesting waterbirds have been coordinated with the North Carolina Wildlife Resources commission.

The Service appreciates the opportunity to provide this report. Please continue to inform the Service of your progress in planning this project. If you have any questions or comments, please contact Howard Hall at 919-856-4520, ext. 27 or by e-mail at Howard_Hall@fws.gov.

Sincerely,

Dr. Garland B. Pardue
Ecological Services Supervisor



FWS/R4:HHall:12/19/1:919-856-4520, ext.27/C:WS_Fin_FWCA.wpd



Attachment

cc (with attachment):

Dave Allen, NCWRC, Trenton, NC
Steve Harrison, NPS, Manteo, NC
Gerald Miller, USEPA, Atlanta, GA
John Dorney, NC DWQ, Raleigh, NC
Ron Sechler, NMFS, Beaufort, NC



WALTER SLOUGH CHANNEL PROJECT
DARE COUNTY, NORTH CAROLINA
FINAL FISH AND WILDLIFE COORDINATION ACT REPORT

Prepared by:

Howard F. Hall

Under the Supervision of:

Dr. Garland B. Pardue

U.S. Fish and Wildlife Service
Ecological Services Raleigh Field Office
Raleigh, North Carolina

December 2001

EXECUTIVE SUMMARY

This report is provided under authority of Section 2(b) of the Fish and Wildlife Coordination Act (FWCA) of 1958 (48 Stat. 401, as amended; 16 U.S.C. 661-667d). A draft report was submitted to the North Carolina Wildlife Resources Commission (NCWRC) for their review and comments in September 1998. Aspects of this report have been coordinated with the NCWRC and this report constitutes the formal report of the U. S. Fish and Wildlife Service (Service) under Section 2(b) of the FWCA.

The Wilmington District, U. S. Army Corps of Engineers (Corps) requested coordination under the FWCA to undertake navigation improvements for Walter Slough. The Walter Slough channel extends from Bodie Island, at the site of a U. S. Coast Guard (USCG) Station and Oregon Inlet Fishing Center (OIFC) westward to the Oregon Inlet to Manteo Channel in Pamlico Sound. The Corps proposes to dredge the channel and assume responsibility for maintenance dredging to create and maintain a safe, reliable channel between the OIFC and the Oregon Inlet to Manteo Channel. Planning is being conducted under the authority of Section 107 of the River and Harbor Act of 1960, as amended. The project scope includes Pamlico Sound at and near the existing channel, the areas through which dredged material would be transported, and the site, or sites, for dredge material disposal.

Navigation channels have been dredged in Pamlico Sound for decades, but studies for Walters Slough are limited. The Corps initiated a dredging study in the late 1980s. The Service released a "preliminary" Draft FWCA Report in March 1986, but the proposal was dropped. The Corps' next consideration occurred in 1990-1991 after damage to the Bonner Bridge. The Corps proposed to dredge the slough in order to establish an emergency ferry service. However, the rapid repair of the bridge eliminated the need for this work. In April 1996, the North Carolina Division of Water Resources requested that the Corps modify permits issued to the USCG to allow for emergency, sidecast dredging of a shoal within the slough. Both the Service and the National Marine Fisheries Service opposed the use of sidecast dredging. The Corps did not authorize this modification.

Pamlico Sound is part of the Albemarle-Pamlico Estuarine System. Physical and biological conditions are strongly influenced by proximity to the Atlantic Ocean. The sound is an isothermal, unstratified, shallow water, lagoonal estuary. The aquatic systems of the project area are relatively unaltered with the exception of maintained navigation channels; dredged material disposal islands; the terminal groin and revetment on the north end of Hatteras (Pea) Island; and Bonner Bridge which spans Oregon Inlet.

The project area is primarily used for recreation. The southern part of Bodie Island is within the Cape Hatteras National Seashore (CHNS), administered by the National Park Service (NPS). Within the CHNS commercial development is controlled and the area provides excellent recreational opportunities. The OIFC supports a fleet of charter boats. The NPS maintains a

boat launching facility at the center. The USCG uses Walter Slough to access the Oregon Inlet to Manteo Channel. Sport fishing is important in the vicinity of Oregon Inlet.

Six biotic communities are considered to be within the project area. These are: (1) estuarine waters; (2) unvegetated, estuarine bottoms; (3) vegetated, estuarine bottoms such as areas of submerged aquatic vegetation (SAV); (4) unvegetated, estuarine, intertidal areas (commonly known as mudflats or sandflats); (5) estuarine, emergent wetlands (primarily salt marsh); and, (6) artificial, dredge disposal islands in Pamlico Sound.

The concerns of the Service include: (1) direct loss of shallow, unvegetated estuarine habitats; (2) direct loss and indirect adverse impacts to areas of SAV that may serve as Primary Nursery Areas (PNA) for important finfish and shellfish; and, (3) adverse habitat impacts associated with transporting sediment to disposal area(s).

Planning guidelines should include: (1) minimizing channel dimensions to reduce direct loss of habitat; (2) avoiding all impacts to areas of SAV; (3) minimizing the production of suspended solids during dredging; (4) avoiding significant habitat impacts in transporting sediment to the disposal area; (5) ensuring that dredged material is free of toxic substances; (6) considering spoil island disposal at a time and in a manner to maximize benefits to colonial nesting waterbirds.

Vertebrates at greatest risk include fish, shorebirds, and colonial nesting waterbirds. The fish fauna within the project area is varied. The diverse biotic communities provide habitats for both permanent and seasonal birds. Shorebirds include sandpipers, plover, gulls, and terns. Colonial waterbirds (such as terns, egrets, herons, night herons, and ibises) nest within the CHNS. These species have nested on artificial spoil islands. Species in the project area protected by the Endangered Species Act include the West Indian manatee (*Trichechus manatus*), all five Atlantic sea turtles, and shortnose sturgeon (*Acipenser brevirostrum*).

Policies of the NPS preclude many of the concerns about future habitat alterations and development that may occur on private land. The outlook for terrestrial amphibians, reptiles, and mammals is a continuation of present conditions. Habitats for upland birds seem secure within the CHNS. The outlook for the federally listed species depends on the success of legislation to prevent direct mortality and preserve habitat. Fish and wildlife species are not facing irreversible population declines such that the impacts of proposed project would be irrelevant. Therefore, all adverse impacts of the project must be considered.

Alternatives for projects that modify and maintain an existing navigation channel are limited, but aspects of the design and construction influence the environmental impacts. These aspects include: (1) channel alignment; (2) channel dimensions (width and depth); (3) type of dredging equipment; (4) location of disposal area(s); (5) sediment transport route(s); and, (6) construction scheduling.

The preferred alternative will balance project goals, environmental impacts, and costs. Use of a hydraulic dredge reflects concerns about the adverse impacts of sidecast dredging. Cost is expected to play a role in disposal area selection. Sediment physical characteristics should play a significant role in area selection. The route of sediment movement will depend on the disposal site. There is probably no single time of year that would avoid adverse impacts to all fish and wildlife resources in the area, but lowest biological activity occurs during the coldest months.

The Corps has determined a basic plan. The dredged channel would be approximately 1.5 miles long and follow the existing alignment. The bottom width would be 60 feet. Depth would be 9 feet at mean low water (7 feet of authorized depth with 2 feet of overdepth). Side slopes would be 3:1. Plans estimate the removal of 84,000 cubic yards of sediment. A pipeline dredge would be used. Initial construction is likely to occur during the period of January 1 through March 31. All disposal is plan for Island D, an existing dredge disposal island in Pamlico Sound. Maintenance is expected to remove 50,000 cubic yards of material every four years.

Dredging would directly impact the animals and habitat in the path of the channel. The project would eliminate unvegetated, estuarine bottoms and has the potential to eliminate areas of SAV. The long-term viability of nearby SAV may be diminished by altering natural currents and other physical bottom characteristics. Construction would create turbid conditions. High turbidity reduces the penetration of sunlight necessary for photosynthesis.

Dredging may release contaminants held within the sediment into the water column. Any contaminants present would be transferred to the disposal site. Harmful substances include toxic metals, organohalogen compounds, and pesticides. During resuspension toxic substances may become adsorbed to small particles of clay or organic matter which can be ingested by aquatic filter feeders.

The hydraulic pipeline could be placed on the estuary bottom. Benthic communities and SAV along the pipeline route may be harmed or destroyed. The pipeline may cross estuarine, emergent wetlands on Island D. Such placement could damage plants.

While disposal on established spoil islands may benefit colonial waterbirds using early successional areas, those species using late successional areas may lose nesting habitat. Sediment disposal during the nesting season would be extremely harmful to colonial waterbirds.

Project goals can be achieved with a minimum of short-term, adverse impacts and negligible, adverse, long-term, environmental consequences. This assessment is predicated on a sufficient project planning and the financial resources to balance project goals with environmental protection. While some measures may increase project costs, some cost increases are justified by the long-term benefits to the ecosystems.

The loss of unvegetated benthic habitat and potential losses of SAV would be minimized by keeping the width and depth of the channel as small as possible. The Corps should use the latest,

available data to determine whether SAV occurs in the path of the channel. If SAV does occur in path, the Corps should attempt to create an alignment which would avoid impacts to SAV. If either submerged or emergent wetlands are destroyed, the Corps should develop a specific plan of compensatory mitigation. Efforts should be made to minimize turbidity associated with dredging, transport to the disposal site, and disposal. If the pipeline is laid on the bottom, the route should be along unvegetated areas. The pipeline should not be placed through emergent wetlands. If material removed from the channel contains toxic substances, special disposal precautions should be developed.

Spoil island disposal has the potential to benefit nesting by colonial waterbirds that use early successional habitat. There should be planning and coordination with state, non-game biologists to ensure the maximum benefit from spoil island disposal.

The Service proposes the following recommendations for incorporation into project plans:

1. The navigation channel should have the minimal width and depth necessary to achieve project goals in order to minimize the loss of unvegetated, estuarine bottoms and SAV. The Service recommends that a 60-foot width and 7-foot depth, plus 2 feet of overdepth, be considered maximum dimensions for the channel.
2. The Corps should ensure that dredging does not remove areas of SAV. All areas of the channel produced by the project should be essentially free of rooted, aquatic plants. Furthermore, the proposed channel, including side slopes should be at least 33 feet (10 meters) from any SAV. If SAV or estuarine wetlands will be impacted, project plans should include a specific plan of compensatory mitigation, including the site of mitigation.
3. Project plans should clearly specify State-designated Primary Nursery Areas and indicate measures taken to prevent any long-term degradation of these sites.
4. Dredging procedures should employ equipment which avoids or minimizes a significant increase in suspended solids in or near the dredge site. These procedures should include safeguards to ensure that leaks from the pipeline do not harm SAV or emergent wetlands around the disposal island. Accidental sediment spills or filling of vegetated wetlands, open water, and vegetated uplands should be immediately corrected by restoring the affected area to its original contour.
5. If the hydraulic pipeline is placed on the bottom of the sound, the pipeline should not be placed on SAV.
6. The path of the hydraulic pipeline should avoid harm to areas of estuarine, emergent wetlands, e.g. *Spartina* marsh. With the exception of small (100 square feet or less)

wetland crossings, mats should be placed on the surface of emergent wetlands along the pipeline route to minimize damage to wetland vegetation.

7. There should be clear and compelling evidence that the project would not introduce any toxic substances into the disposal area. The consideration of toxic substances should involve more than a professional opinion that harmful compounds are not likely to be present. Laboratory analyses of sediment samples would provide the best data on the degree to which the sediment removed would impact organisms in the disposal area.
8. Sediment placement on established disposal islands in Pamlico Sound would enhance nesting habitat for colonial waterbirds nesting in early successional areas (bare sand), but may eliminate nesting habitat for species using areas in a later successional stage. The use of existing disposal islands should be carefully coordinated with state non-game biologists to ensure that the nesting habitat created has a high probability of use by early successional nesters and that there is an adequate amount of any mid- to late successional nesting habitat which would be eliminated by the project.
9. If dredging produces permanent damage to areas of SAV or emergent wetlands, the Corps should develop and implement a compensatory mitigation plan that results in no net loss of these valuable habitats.

With careful planning project goals can be achieved with only minor short-term, adverse environmental impacts and negligible long-term impacts. Sufficient environmental information is available, or could be obtained, to fully describe the natural resources at risk with the proposed project and to develop practical recommendations to protect the fish and wildlife resources.

The position of the Service is that there is a need to maintain safe, reliable passage through the area and the purpose of the current project addresses that need. The project area provides high quality fish and wildlife habitat and every effort must be made to minimize adverse impacts to it. Without appropriate safeguards and mitigation, the work could have a significant long-term adverse impacts on the environment. Service recommendations provide such safeguards and should be fully incorporated in project plans.

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SECTION 1. INTRODUCTION

Authority

This report is provided under authority of Section 2(b) of the Fish and Wildlife Coordination Act (FWCA) of 1958 (48 Stat. 401, as amended; 16 U.S.C. 661-667d). This Act established two important federal policies which are: (1) fish and wildlife resources are valuable to the nation; and, (2) the development of water resources is potentially damaging to these resources. In light of these principles, the FWCA mandates that:

“... wildlife conservation shall receive equal consideration and be coordinated with other factors of water-resource development programs through effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation and rehabilitation.”

The FWCA essentially established fish and wildlife conservation as a coequal purpose or objective of federally funded or permitted water resources development projects.

In order to fully incorporate the conservation of fish and wildlife resources in the planning of water resources development, the FWCA mandates that federal agencies consult with the U. S. Fish and Wildlife Service (Service) and the state agency with the responsibility for fish and wildlife resources in the project area. The state agency with this responsibility is the North Carolina Wildlife Resources Commission (NCWRC).

Consultation during project planning is intended to allow state and federal resource agencies to determine the potential adverse impacts on fish and wildlife resources and develop recommendations to avoid, minimize, and/or compensate for detrimental impacts. Therefore, this report will:

1. Describe the fish and wildlife resources at risk in the project area;
2. Evaluate the potential adverse impacts, both direct and indirect, on these resources;
3. Develop recommendations to avoid, minimize, or compensate for any unavoidable, adverse environmental impacts; and,
4. Present an overall summary of findings and the position of the Service on the project.

Subject of This Report

The Wilmington District, U. S. Army Corps of Engineers (Corps) has contacted the Service regarding a proposal for the Corps to assume the responsibility for maintaining Walter Slough Channel in Pamlico Sound (Figure 1). The planning process is being conducted under the

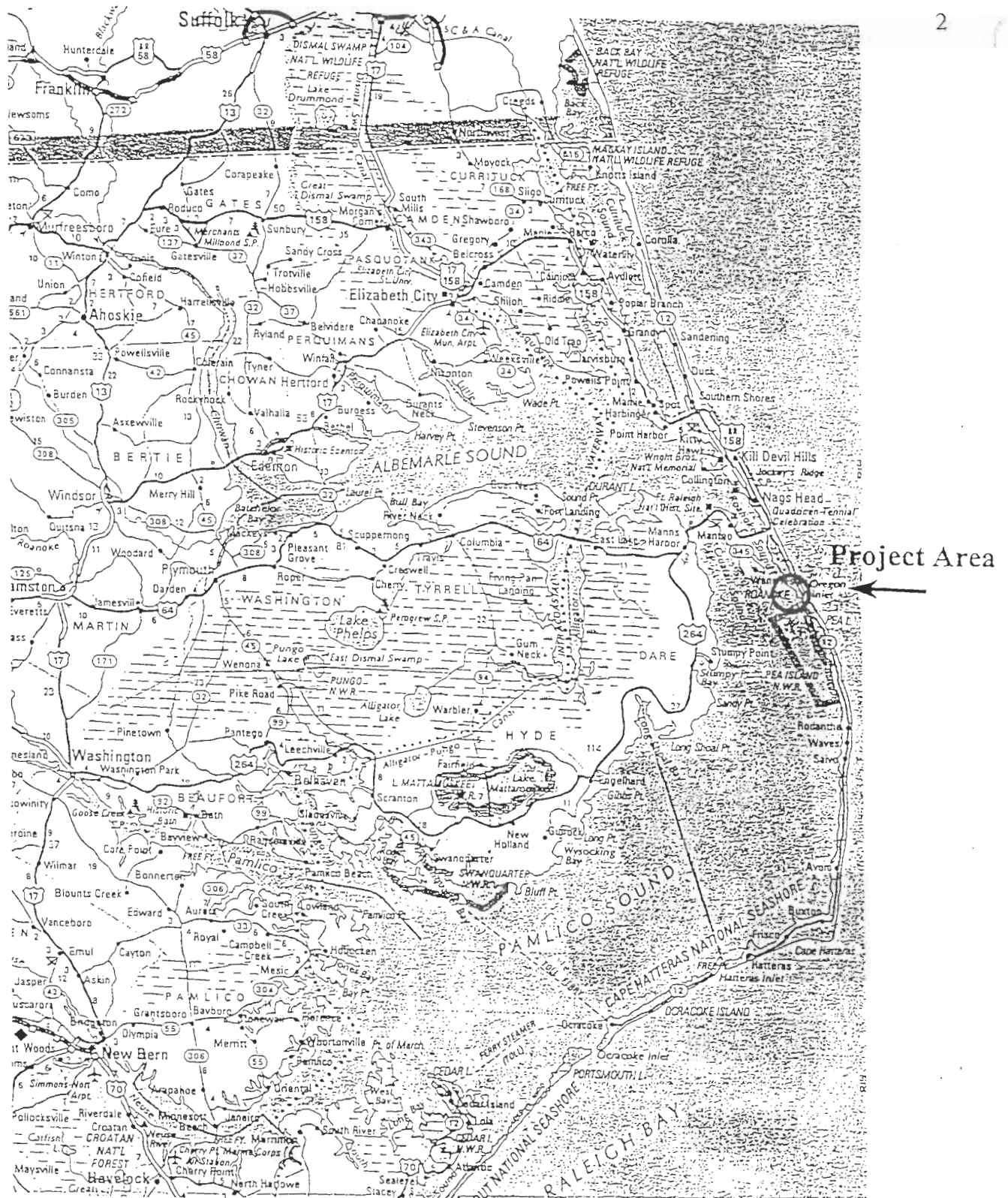


Figure 1. Northeastern North Carolina with the general location of the Walter Slough project area within Pamlico Sound.

authority of Section 107 of the River and Harbor Act of 1960, as amended. A Draft Detailed Project Report (DDPR) and Environmental Assessment (EA) were released in August 1999.

Walter Slough extends from western side of Bodie Island, at the site of a U. S. Coast Guard (USCG) Station and Oregon Inlet Fishing Center (OIFC), to the Oregon Inlet to Manteo Channel in Pamlico Sound (Figure 2.) The primary need for the project results from shoaling that occurs along the existing navigation channel. Such shoaling creates shallow areas which damage vessels, create delays, and prohibit passage. The channel has been maintained periodically by local and state governments as well as the USCG. The DDPR states (p. 5) that the future of emergency dredging funds from the State is uncertain and the USCG has indicated that additional funds to dredge Walter Slough are not available.

In light of the navigational difficulties produced by shoaling in the slough, the purpose of the proposed project is to create and maintain a safe, reliable channel between the OIFC and the Oregon Inlet to Manteo Channel (Figure 3). The project would provide recreational boating access between Old House Channel and existing boat launching and marina facilities at Bodie Island.

Scope

The scope of the proposed project includes the area of Pamlico Sound where the existing channel is located and areas adjacent to the existing channel, the areas through which dredged material would be transported, and the site, or sites, for dredge material disposal. The habitats within the project area include: (1) estuarine waters of Pamlico Sound; (2) unvegetated, shallow estuarine bottoms; (3) beds of estuarine, submerged aquatic vegetation (SAV); (4) estuarine, emergent wetlands; and, (4) artificial, dredge disposal islands within Pamlico Sound.

Prior Studies and Reports

While navigation channels within Pamlico and Roanoke Sounds have been dredged for decades, specific studies for Walters Slough are limited. The Corps initiated a study of a Walter Slough Channel Project in the late 1980s. Funds were transferred to the Service for preparation of FWCA reports. The Service released a "preliminary" Draft FWCA Report on March 27, 1986 (U. S. Fish and Wildlife Service [hereafter USFWS] 1986). However, the Service has no records that the official Draft FWCA Report was released or that a Final Report was produced. The Service concluded that project planning had been terminated.

The second consideration of Corps dredging in the project area occurred in late 1990 and early 1991. In October 1990 a hopper dredge used to maintain the Oregon Inlet Channel struck Bonner Bridge and "... demolished several spans" (North Carolina Department of Transportation [hereafter NCDOT] 1996). This damage necessitated the reestablishment of a ferry service between Bodie and Hatteras Islands until bridge repairs could be made. The northern terminus of the ferry was at the OIFC. In the same month as the damage occurred, an

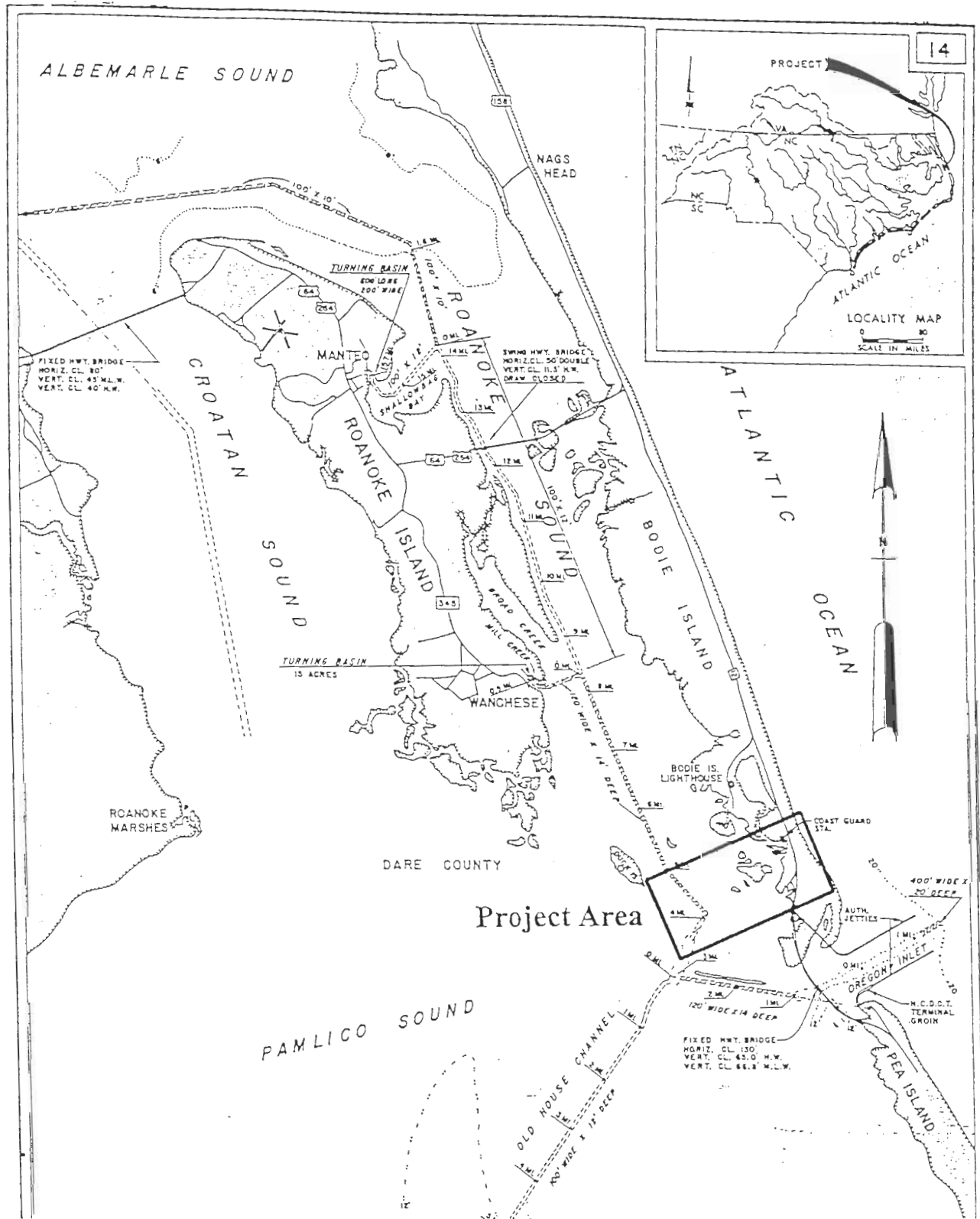


Figure 2. Area surrounding location of the Walter Slough project, Dare County, North Carolina. The project would extend from the Oregon Inlet Fishing Center (OIFC), adjacent to U. S. Coast Guard Station, to the Oregon Inlet Channel in Pamlico Sound. Source: Wilmington District, U. S. Army Corps of Engineers, Wilmington, North Carolina.

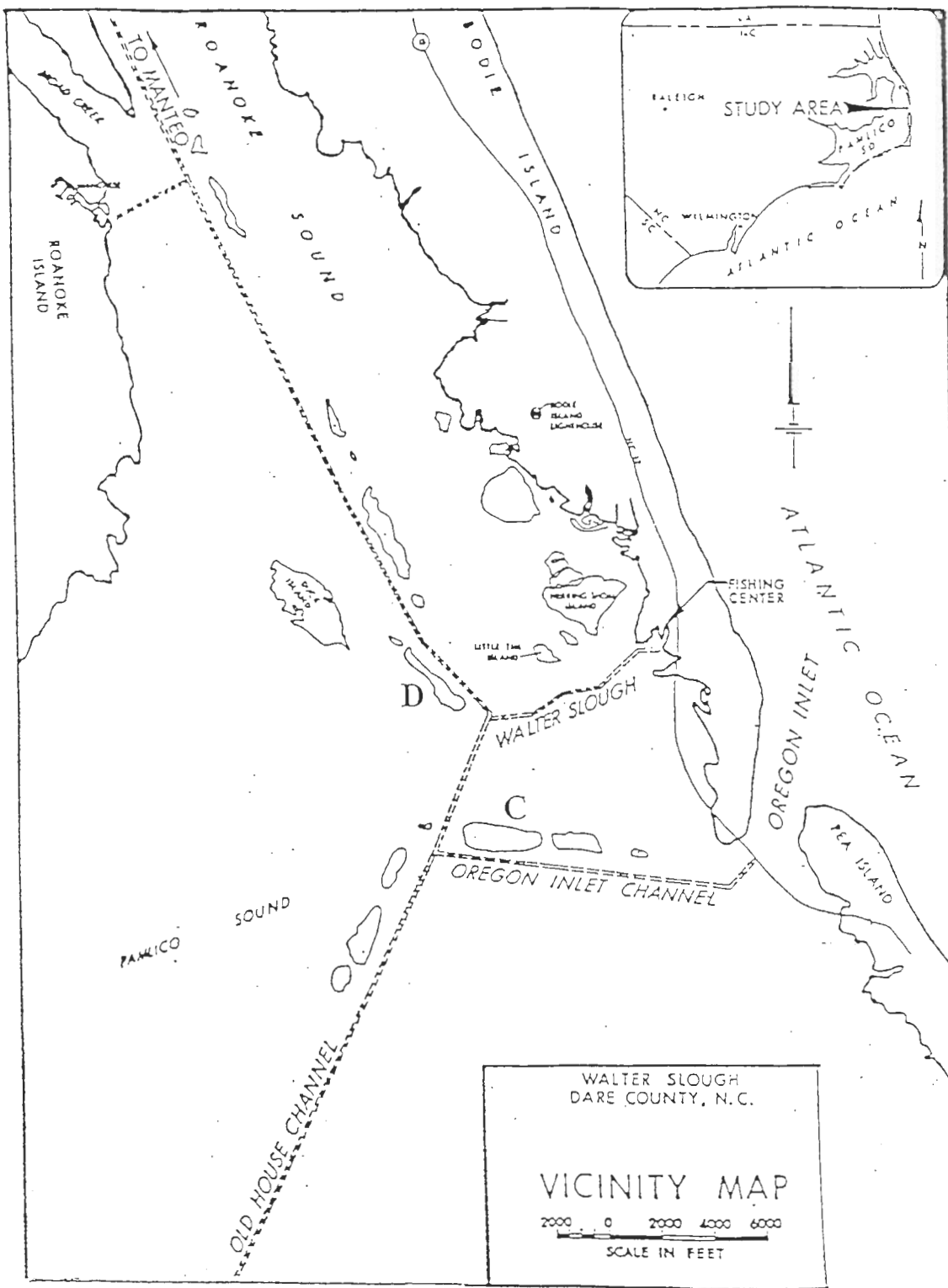


Figure 3. General location of Walter Slough from the Oregon Inlet Fishing Center on Bodie Island to the Oregon Inlet Channel. The letters "C" and "D" designate artificial disposal islands which may be used for this project. Source: Wilmington District, U. S. Army Corps of Engineers, Wilmington, North Carolina.

Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for emergency dredging of the slough were released (U. S. Army Corps of Engineers [hereafter USACOE] 1990). This work called for the creation of a channel 70 feet wide and 8 feet deep at mean low water (MLW). The proposal called for the use of a sidecast dredge. While potential damage to submerged aquatic vegetation (SAV) by sidecast dredging was acknowledged, the emergency nature of the work prevented a full consideration of impacts to SAV. The public notice (PN) for the work, issued on January 24, 1991, stated that an "after-the-fact" assessment would be made and that a compensatory mitigation plan would be developed and implemented. The PN indicated that the dredging operation would establish a channel 10 feet deep by 70 feet wide. The National Marine Fisheries Service (NMFS) opposed the use of sidecast dredging. On January 25, 1991, the Ferry Division of the North Carolina Department of Transportation (NCDOT) withdrew the application to conduct emergency dredging in the channel due to the belief that bridge repairs would be completed by the time the dredging operation could be initiated.

In April 1996, the North Carolina Division of Water Resources requested the Corps to modify the permit of the USCG to allow for emergency, sidecast dredging of a shoal, estimated to consist of 3,000 cubic yards of sand, within Walter Slough. On April 30, 1996, both the Service and NMFS notified the Corps that they were opposed to use of sidecast dredging at the proposed site. On May 3, 1996, the Corps informed the USCG that emergency dredging would not be authorized at that time since "... there was no immediate hazard to life or property which cannot be addressed by simply marking the existing shoal appropriately and requiring boaters to avoid it until such time as the shoal can be dredged by appropriate means."

A draft of this report was submitted to the NCWRC in September 1998 for their review and comments. The Service has coordinated the disposal aspects of the project with the NCWRC in order to benefit colonial nesting waterbirds in the project area.

SECTION 2. STUDY AREA DESCRIPTION

This section examines the geologic and hydrologic characteristics of the project area. The major plant communities and important invertebrates which constitute the base of the food chain are described. This section serves as a foundation for the discussion of fish and wildlife resources of the project area.

General Project Area

The Walter Slough Channel is located in Pamlico Sound (Figure 3). The hydrology, geology, and ecology of the area is strongly influenced by oceanic conditions. The area is characterized by Bodie Island, Oregon Inlet, and protected estuarine waters.

Pamlico Sound is part of the Albemarle-Pamlico Estuarine System (APES) which contains four other sounds: Albemarle, Croatan, Roanoke, and Core (Figure 1). With a total area of 2,560 mi², the APES is the second largest estuarine system in the United States (Epperly and Ross 1986).

Pamlico Sound is the largest enclosed, barrier island estuary in the United States. The sound has an area of approximately 1,680 mi². It extends approximately 87 miles in the northeast-southwest orientation and 15.5-34.2 miles in the northwest-southeast orientation. A maximum depth of approximately 23 feet occurs in the west end of the sound. Circulation within the sound is predominantly in response to wind (Inman and Dolan 1989). It is an isothermal, unstratified, shallow water, lagoonal estuary. Because the sound is shallow, with an average depth of 16 feet (Epperly and Ross 1986, Pietrafesa and Janowitz 1988), the vertical water column is homogeneously mixed and exhibits little temperature, oxygen, or salinity stratification (Pietrafesa et al. 1986). Vertical temperature differences within the sound do not exceed 3.6° F.

The general nature of the sound varies with the season. In the winter the area is dominated by riverine inputs because of high rainfall and low evaporation. Freshwater flows directly into the sound from the Neuse, Tar, Pungo, and Pamlico Rivers and indirectly from the Chowan and Roanoke Rivers via Albemarle, Roanoke, and Croatan Sounds. In the summer lower rainfall and higher evaporation rates cause the area to function more like a lagoon.

Within Pamlico and Roanoke Sounds, strong ocean influences are considerably diminished by the Outer Banks and the presence of a single outlet to the sea, Oregon Inlet. Lunar tides, which average 2 feet at Oregon Inlet, are almost negligible at the ports of Wanchese and Manteo (Shallowbag) Bay. Instead of lunar tides, Pamlico Sound is directly influenced by wind driven currents (Pietrafesa et al. 1986).

There is a rapid transition from euhaline marine conditions, salinity of 35 parts per thousand (ppt), to oligohaline conditions, salinity of less than 5 ppt, over the short distance from Oregon Inlet to the north end of Roanoke Island. However, salinity in the Roanoke Sound may shift drastically depending on tide, wind, and river flow conditions. The resulting effects are generally lower and more variable salinity along the entire reach of Roanoke Sound. Salinity and/or tidal conditions restrict the distribution of marine flora and fauna in the sounds.

The aquatic systems of the project area are relatively unaltered with the exception of maintained navigation channels; dredged material disposal islands; the terminal groin and revetment on the north end of Hatteras (Pea) Island; and Bonner Bridge which spans Oregon Inlet. The absence of large population centers and manufacturing facilities has minimized municipal and industrial waste discharges in the immediate project area. The lack of development has generally facilitated the existence of a natural environment and a thriving tourism industry.

The OIFC supports a fleet of more than 40, large, commercial charter boats. The NPS maintains a boat launching facility at the center. These boats and vessels of the USCG use Walter Slough to access the Oregon Inlet to Manteo Channel. In 1985 the USCG dredged the slough to create a

channel with a width of 50 feet and a depth of 7 feet at MLW with no overdepth (USACOE 1990). In 1990 the slough had a depth of approximately 5 feet at MLW.

Sport fishing is extremely important in the vicinity of Oregon Inlet for such game species as: bluefish (*Pomatomus saltatrix*), year round; weakfish (*Cynoscion regalis*), May-July; spotted seatrout (*Cynoscion nebulosus*), spring and fall; summer flounder (*Paralichthys dentatus*), May-October; red drum (*Sciaenops ocellatus*), late fall and March; and kingfish (*Menticirrhus* spp.), June-September. Inside the inlet, sport fishermen may also take Atlantic croaker (*Micropogonias undulatus*) and spot (*Leiostomus xanthurus*), October-December; black drum (*Pogonias cromis*), early spring; and striped bass (*Morone saxatilis*), March-May and October-December. Most surf fishing is concentrated along both sides of Oregon Inlet and on the southern catwalk which flanks Bonner Bridge. Fishing in this area is generally limited to those who seek solitude which is not normally found around the more readily accessible fishing locations adjacent to Oregon Inlet. Overall, Oregon Inlet is regarded as one of the most important sport fishing spots on the East Coast and attracts fishermen from North Carolina and other states.

Biotic Communities

This report will consider six biotic communities in the project area.

Estuarine Waters

The estuarine waters of Pamlico Sound provide habitat for a diversity of aquatic life. Large phytoplankton populations, dominated by various diatoms, are grazed upon by larvae of various marine and estuarine fish, invertebrates, and zooplankton.

Unvegetated Estuarine Bottoms

The actual dredging would impact primarily unvegetated, estuarine bottoms. The open waters of the sound generally provide sandy substrates except in the deeper central basin and near river mouths where finer sediment fractions accumulate (Epperly and Ross 1986).

Most benthic habitats west of Bonner Bridge are potentially productive. Benthic dwelling invertebrates and organic bottom materials are fed upon by fishes, crabs, and probably shrimp. Estuarine benthic fauna near Oregon Inlet include polychaetes (*Nereis succinea*, *Laeonereis culveri*, and *Heteromastus filiformis*), decapods (*Rithropanopeus harrisi* and *Palaemonetes pugio*), amphipods (*Corophium lacustre*, *Gammarus fasciatus*, and *G. palustris*), isopods (*Cyathura polita* and *Cassidinidea ovalis*), tanaids (*Hargeria repax*), and mollusks (*Rangia cuneata*, *Geukensia demissa*, *Macoma balthica*, and *Teredo* sp.) (CZR, Inc. 1992). Bottom-dwelling polychaetes, oligochaetes, amphipods, isopods, and the commercially valuable oyster (*Crassostrea virginica*) and hard clam (*Mercenaria mercenaria*) ingest both phytoplankton and zooplankton. The wedge clam (*Rangia cuneata*) occurs along the eastern side of dredge disposal islands and is probably common throughout much of Roanoke Sound.

Vegetated, Estuarine Bottoms - Submerged Aquatic Vegetation (SAV)

Some areas surrounding Walter Slough have been mapped as habitat for SAV by the Southeast Fisheries Science Center, Beaufort Laboratory, Beaufort, North Carolina. These areas form a complex and important ecosystem and commonly include eel grass (*Zostera marina*), shoal grass (*Halodule wrightii*), and widgeon grass (*Ruppia maritima*). These beds occur in isolated patches as well as covering extensive areas. Extensive areas of SAV may be called seagrass meadows or seagrass beds.

Seagrass systems are important to estuarine vitality (Thayer et al. 1979, 1981; Ferguson et al. 1981; Homiak et al. 1982; CZR, Inc. 1992; Lippson and Lippson 1997, pp. 164-178). Specifically, seagrass habitats serve as important nursery areas for many fish species (Thayer et al. 1979; Miller and Dunn 1980; Epperly and Ross 1986; Kenworthy et al. 1988; Noble and Monroe 1991; Lippson and Lippson 1997, pp. 172-175).

Areas of SAV are frequently observed to have conspicuously large amounts of biomass (Kenworthy et al. 1988). Such biomass is the result of high rates of net primary productivity. Representative rates for photosynthetic carbon (C) fixation of seagrass leaves are 0.3-0.8 g C/m²/day for *Z. marina*, 0.9-16.0 g C/m²/day for *Thalassia testudinum*, and 0.5-0.8 g C/m²/day for *H. wrightii* (Kenworthy et al. 1988). Some seagrass systems approach productivity rates observed in subsidized agricultural crops. Based on several reports, Kenworthy et al. (1988) note that epiphytic organisms may attach to older seagrass leaves and provide additional sources of primary productivity which may be as much as one-third or more of the primary productivity of the actual seagrass.

Unvegetated, Estuarine, Intertidal Areas

These areas are commonly known as mudflats or sandflats depending on the nature of the substrate. In the late 1970s Island D had marginal area of sand with little or no vegetation (Figure 4). There is normally a range of habitat types within a particular flat based on the degree of tidal flooding. Rooted aquatic plants are not characteristic of intertidal flats (Lippson and Lippson 1997, p. 51). However, other forms of plant life, such as microscopic algae, thrive on the flats. Bacteria and algae are highly productive on flats and form thin sheets covering shells and sediment particles.

The mobile, epifaunal animals (occurring on or above the surface) in this community are primarily crustaceans and snails that prey on the rich supply of buried infauna (Lippson and Lippson 1997, p. 53). The zone covered by only the high tide is occupied by semi-terrestrial crustaceans that can live out of water for long periods. Many foragers, such as blue crab (*Callinectes sapidus*), small fish, and shrimp, come in with the tide to feed on surface detritus or to prey on intertidal burrowers. However, these species leave the flats on the receding tide and are more characteristic of shallow, estuarine waters.

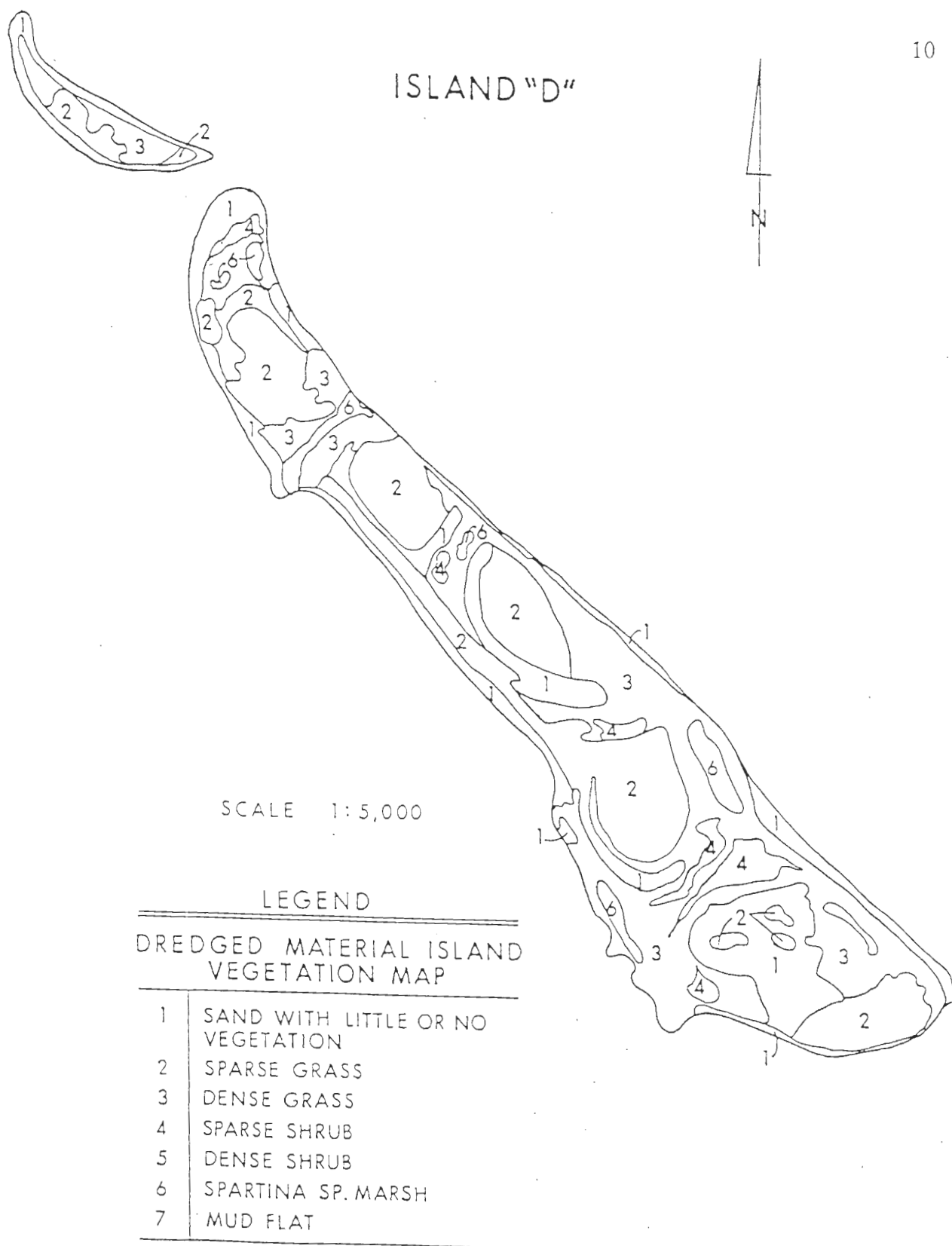


Figure 4. General biological communities on the artificial dredge material disposal Island D in the late 1970s. Source: U. S. Army Corps of Engineers, Wilmington District, 1979.

A detailed account of the ecology of intertidal flats in North Carolina has been prepared by the Service (Peterson and Peterson 1979).

Estuarine, Emergent Wetlands

A variety of estuarine wetlands characterized by emergent vegetation exist along the soundside margin of the Outer Banks. In the late 1970s Island D had several disjunct area of *Spartina* spp. marsh. These areas have been given a diversity of names based on the variations in the dominant vegetation. A detailed, ecological account of southeastern, tidal salt marshes is given by Weigert and Freeman (1990).

A diverse, high marsh community occupies a non-tidal zone between the upland communities and the shore of the sound (CZR, Inc. 1992). High marsh is generally found on sandy flats of old overwash terraces or old tidal deltas that are no longer in the intertidal zone. The water table is close to the surface, and irregular flooding from strong winds and/or seasonally high tides create conditions that allow the dominance of several plant species. The vegetation of the high marsh is usually diverse as it contains species from other grassland and dune communities, as well as some intertidal marsh species. Where flooding is more regular, co-dominant species include saltmarsh [smooth] cordgrass (*Spartina alterniflora*), black needlerush (*Juncus roemerianus*), salt grass (*Distichlis spicata*), sea ox-eye [seaside oxeye] (*Borrchia frutescens*), and sea lavender (*Limonium carolinianum*). Some sections of high marsh appear as meadows dominated largely by saltmeadow cordgrass (*Spartina patens*) and rushes (*Juncus* spp.).

Black needlerush marsh occurs within the intertidal zone. This emergent wetland community consists of homogenous stands of black needlerush (CZR, Inc. 1992). Irregular flooding controls the distribution of this common marsh species, and the community is often called a high marsh. A previous survey in association with the proposed replacement of the Bonner Bridge found large stands of black needlerush throughout the southern tip of Bodie Island where the unconsolidated sand has accreted and provided conditions suitable for irregular flooding (CZR, Inc. 1992). Saltmarsh cordgrass is often found along the lower fringes of this community.

Saltmarsh cordgrass marsh, like the black needlerush community, is within the intertidal zone. However, flooding is regular and the community is often called a low marsh. It occurs in pure stands along the sound side and southern tip of Bodie Island. Along the fringe of tidal creeks, the community receives regular tidal inundation and marsh plants provide stability for the shoreline margins. Spoil islands in the sound are often covered with smooth cordgrass where the land is regularly flooded. This community typically provides nursery areas for various species of shrimp, crabs, and marine and estuarine fish. In the Chesapeake region, the low marsh provides habitat for the marsh periwinkle (*Littorina irrorate*), Atlantic ribbed mussel (*Geukensia demissa*), and fiddler crabs (*Uca* spp.) (Lippson and Lippson 1997).

Dredge Disposal Islands

These islands in some ways resemble overwash fans from the beach. Instead of storm waves picking up sand from the beach and depositing it inland or on the estuarine shore, a dredge removes sediment from the navigation channels and places it in shallow estuarine water. If enough sediment is placed in one area the material rises above the water line and becomes dry land. The new above water surface undergoes wind sorting, and finer particles are removed. The resulting area is dominated by coarse sand and shell fragments. These areas also undergo normal plant succession with stages characterized by sparse forbs, denser forbs and grasses, and shrubs. In the late 1970s Island D had a diversity of plant communities ranging from unvegetated sand flats to sparse shrubs (Figure 4). However, the addition of new dredge material starts the process over again from bare sand.

SECTION 3. FISH AND WILDLIFE CONCERNS AND PLANNING OBJECTIVES

The involvement of the Service in this planning process is in response to a Congressional mandate through the FWCA which directs that the conservation of fish and wildlife resources shall receive full and equal consideration and be coordinated with other features of federal projects. Fish, wildlife, and their habitats are valuable public resources which are conserved and managed for the people by state and federal governments. If proposed land or water developments may reduce or eliminate the public benefits that are provided by such natural resources, then state and federal resources agencies have a responsibility to recommend means and measures to mitigate such losses. In the interest of serving the public, it is the policy of the Service to seek to mitigate losses of fish, wildlife, and their habitats and to provide information and recommendations that fully support the Nation's needs for fish and wildlife resource conservation as well as sound economic and social development through balanced, multiple use of the Nation's natural resources.

Fish and Wildlife Service Concerns

The project area contains valuable habitat for a broad diversity of fish and wildlife resources. Any construction project has the potential cause direct, short-term harm to these resources and indirect harm through the permanent loss or alteration of habitat. In general, the Service is concerned about the following environmental issues:

1. Direct loss of shallow, unvegetated estuarine bottoms;
2. Direct loss and indirect adverse impacts to areas of SAV that may serve as Primary Nursery Areas (PNA) for important finfish and shellfish;
3. Adverse habitat impacts associated with transporting sediment to disposal area, such as hydraulic pipelines placed directly on areas of SAV or emergent, estuarine wetlands.

Planning Objectives

Careful planning and a conscientious balancing of economic considerations with environmental concerns can produce a projects with minimal, short-term and long-term environmental impacts. The following general planning guidelines are suggested:

1. Channel dimensions should minimized to the extent possible to reduce direct loss of all estuarine habitats and the amount of material to be transported and placed elsewhere;
2. All available technology should be utilized to avoid both direct and indirect impacts on areas of SAV;
3. Dredging procedures should minimize any increase in suspended solids which would be harmful to plants and animals in the project area;
4. The movement of dredged material from the slough to the disposal site should not impact areas of SAV or estuarine emergent wetlands;
5. There should be evidence that the sediment removed does not contain toxic substances;
6. Sediment placement should be scheduled at a time of lowest biological activity; the benefits to species of colonial water birds which would gain nesting habitat should be balanced against the needs of species which would lose nesting habitat; and efforts should be made to configure the material for optimal benefit by colonial waterbirds.

In accordance with the FWCA, as amended, these planning objectives should be given full and equal consideration with other features of the Walter Slough Project.

SECTION 4. EVALUATION METHODS

Descriptions of natural resources present within the study area and the preliminary assessment of the environmental impacts of the proposed project are based on previous studies for similar projects, published literature, and personal communications with knowledgeable individuals. Published reports and studies were examined to determine their relevance to the proposed project. Material which described potential environmental impacts of similar projects and methods of reducing these impacts are incorporated by reference in this report.

Service biologists are familiar with the project area. Ecological Services biologists with the Raleigh Field Office have visited the Oregon Inlet area on many occasions in regard to the proposed construction of a dual jetty system at Oregon Inlet and projects undertaken by the NCDOT. On August 23, 1998, a Service biologist made a brief, walking tour of the OIFC and the surrounding area.

Nomenclature in this report follows Tiner (1993) for coastal plants; Rohde et al. (1994) for freshwater fish; Robins and Ray (1986) for marine fish; Martof et al. (1980) for amphibians and reptiles; Potter et al. (1980) for birds; and Webster et al. (1985) for mammals.

Both common and scientific names from cited literature follow the original publication. If the Service is aware of a widely accepted synonym for the common name, that synonym is given in brackets. If the Service is aware of a change in the scientific name of a given species, the revised nomenclature is included in brackets following the published name.

SECTION 5. EXISTING FISH AND WILDLIFE RESOURCES

This section presents information on the fish and wildlife resources which have been reported on Bodie and/or Hatteras (Pea) Islands and the surrounding waters. Those species which are listed as threatened or endangered under the Endangered Species Act (ESA) are discussed in a separate section.

Fish and Wildlife Resources by Vertebrate Class

Amphibians

The amphibian fauna of the project area is limited. This may be due to the requirement for a moist location or standing freshwater in which to lay their eggs. It is unlikely that the proposed project would have a significant impact on amphibians, and this class will not be considered in detail.

Terrestrial Reptiles

Terrestrial reptiles are present in the project area, but species diversity is low. As with amphibians, project impacts on the class are likely to be minor and short-lived. Therefore, the group will not be considered in detail. Sea turtles are protected species and are discussed below.

Mammals

Mammal in the project area would be limited be marine mammals such as the bottle-nosed dolphin (*Tursiops truncatus*) and transient manatee (*Trichechus manatus*) during the warmer months of the year.

Marine and Estuarine Adult Fish

The estuarine and marine fish fauna within the project area is varied. Surveys at different times of the year with different equipment are likely to produce different results. Table 1 gives 76 fish species which were collected near the Bonner Bridge (CZR Inc. 1992).

Table 1. Fish species collected near the Bonner Bridge over Oregon Inlet, south of Walter Slough, Dare County, North Carolina. List taken from CZR, Inc. (1992a) and based on unpublished data from trawl surveys conducted by the North Carolina Division of Marine Fisheries. Life history strategy based on Epperly (1984).

Common Name	Scientific Name	Life history strategy
Blueback herring	<i>Alosa aestivalis</i>	Anadromous
American eel	<i>Anguilla rostrata</i>	Catadromous
Striped anchovy	<i>Anchoa hepsetus</i>	Estuarine indigenous
Bay anchovy	<i>Anchoa mitchilli</i>	Estuarine indigenous
Skilletfish	<i>Gobiesox strumosus</i>	Estuarine indigenous
Killifish spp.	<i>Fundulus spp.</i>	Estuarine indigenous
Inland silverside	<i>Menidia beryllina</i>	Estuarine indigenous
Atlantic silverside	<i>Menidia menidia</i>	Estuarine indigenous
Dusky pipefish	<i>Syngnathus floridae</i>	Estuarine indigenous
Northern pipefish	<i>Syngnathus fuscus</i>	Estuarine indigenous
Chain pipefish	<i>Syngnathus louisianae</i>	Estuarine indigenous
Spotfin mojarra	<i>Eucinostomus argenteus</i>	Estuarine indigenous
Striped blenny	<i>Chasmodes basquianus</i>	Estuarine indigenous
Feather blenny	<i>Hypsoblennius hentzi</i>	Estuarine indigenous
Sharptail goby	<i>Gobionellus hastatus</i>	Estuarine indigenous
Naked goby	<i>Gobiosoma bossi</i>	Estuarine indigenous
Green goby	<i>Microgobius thalassinus</i>	Estuarine indigenous
Hogchorer	<i>Trinectes maculatus</i>	Estuarine indigenous
Largemouth bass	<i>Micropterus salmoides</i>	Freshwater transient
Atlantic stingray	<i>Dasyatis sabina</i>	Marine transient
Speckled worm eel	<i>Myrophis punctatus</i>	Marine transient
Inshore lizardfish	<i>Synodus foetens</i>	Marine transient
Oyster toadfish	<i>Opsanus tau</i>	Marine transient
Pollock	<i>Pollachius virens</i>	Marine transient
Southern hare	<i>Urophycis floridana</i>	Marine transient
Spotted hake	<i>Urophycis regia</i>	Marine transient
Bluespotted cornetfish	<i>Fistularia tabacaria</i>	Marine transient
Lined seahorse	<i>Hippocampus erectus</i>	Marine transient
Rock sea bass	<i>Centropristis philadelphica</i>	Marine transient
Black sea bass	<i>Centropristis striata</i>	Marine transient
Gag	<i>Mystroperca microlepis</i>	Marine transient
Bluefish	<i>Lagodon rhomboides</i>	Marine transient
Atlantic moonfish	<i>Selene setapinnis</i>	Marine transient
Lookdown	<i>Selene vomer</i>	Marine transient
Mutton snapper	<i>Lutjanus analis</i>	Marine transient
Gray snapper	<i>Lutjanus griseus</i>	Marine transient
Lane snapper	<i>Lutjanus synagris</i>	Marine transient

Table 1. (continued). Fish species collected near the Bonner Bridge over Oregon Inlet, Dare County, North Carolina.

Common Name	Scientific Name	Life history strategy
Sheepshead	<i>Archosargus probatocephalus</i>	Marine transient
Southern kingfish	<i>Menticirrhus americanus</i>	Marine transient
Atlantic spadefish	<i>Chaetodipterus faber</i>	Marine transient
Slippery dick	<i>Halichoeres bivittatus</i>	Marine transient
Tautog	<i>Tautoga onitis</i>	Marine transient
Northern sennet	<i>Sphyraena borealis</i>	Marine transient
Southern stargazer	<i>Astroscopus y-graecum</i>	Marine transient
Crested blenny	<i>Hypleurochilus geminatus</i>	Marine transient
Atlantic cutlassfish	<i>Trichiurus lepturus</i>	Marine transient
Spanish mackerel	<i>Scomberomorus maculatus</i>	Marine transient
Harvestfish	<i>Peprilus alepidotus</i>	Marine transient
Butterfish	<i>Peprilus triacanthus</i>	Marine transient
Northern searobin	<i>Prionotus carolinus</i>	Marine transient
Striped searobin	<i>Prionotus evolans</i>	Marine transient
Leopard searobin	<i>Prionotus scitulus</i>	Marine transient
Bighead searobin	<i>Prionotus tribulus</i>	Marine transient
Bay whiff	<i>Citharichthys spilopterus</i>	Marine transient
Windowpane	<i>Scophthalmus aguosus</i>	Marine transient
Blackcheek tonguefish	<i>Symphurus plagiosa</i>	Marine transient
Orange filefish	<i>Aluterus schoepfi</i>	Marine transient
Planehead filefish	<i>Honacanthus hispidus</i>	Marine transient
Northern puffer	<i>Sphoeroides maculatus</i>	Marine transient
Striped burrfish	<i>Chilomysterus schoepfi</i>	Marine transient
Atlantic menhaden	<i>Bevoortia tyrannus</i>	Migratory marine
Creville jack	<i>Caranx hippos</i>	Migratory marine
Pigfish	<i>Orthopristis chrysoptera</i>	Migratory marine
Littlehead porgy	<i>Calamus proridens</i>	Migratory marine
Spottail pinfish	<i>Diplodus holbrooki</i>	Migratory marine
Pinfish	<i>Lagodon rhomboides</i>	Migratory marine
Silver perch	<i>Bairdiella chrysoura</i>	Migratory marine
Spotted seatrout	<i>Cynoscion nebulosus</i>	Migratory marine
Weakfish	<i>Cynoscion regalis</i>	Migratory marine
Spot	<i>Leiostomus xanthurus</i>	Migratory marine
Atlantic croaker	<i>Micropogonias undulatus</i>	Migratory marine
Red drum	<i>Sciaenops ocellatus</i>	Migratory marine
Striped mullet	<i>Mugil cephalus</i>	Migratory marine
Gulf flounder	<i>Paralichthys albigutta</i>	Migratory marine
Summer flounder	<i>Paralichthys dentatus</i>	Migratory marine
Southern flounder	<i>Paralichthys lethostigma</i>	Migratory marine

Table 1 lists only a single anadromous fish, the blueback herring (*Alosa aestivalis*). However, other anadromous fish could occur the project area. These species include the striped bass (*Morene saxatilis*), hickory shad (*Alosa aestivalis*), alewife (*A. mediacris*), and American shad (*A. sapidissima*). Both the Atlantic sturgeon (*Acipenser oxyrinchus*) and the federally endangered shortnose sturgeon (*A. brevirostrum*) may use the inlet to pass from the ocean to freshwater spawning areas.

Birds

The variety of upland, pelagic, and wetland communities provides many habitats for birds, both permanent and seasonal species. Coastal barrier islands probably harbor a greater variety of bird species than any other ecosystem in the continental United States (Wells and Peterson, undated). Fussell and Lyons (1990) list the birds which have been recorded in the CHNS. That list contained 319 species regularly found on the Outer Banks and an additional 56 species which are considered accidentals.

Colonial nesting waterbirds need to be considered due to the potential for sediment disposal on spoil islands in the sound. Data compiled from several sources indicate that 24 species of colonial waterbirds occur in CHNS and that 21 species may nest in the project area (Table 2). Artificial, spoil islands provide valuable nesting habitat for colonial waterbirds that have lost much of their natural beach habitat to development and disturbance caused by humans and their domestic animals. One such island, designated as DR-005-03 (Figure 5), supported nests of the gull-billed tern (*Gelochelidon nilotica*), royal tern (*Sterna maxima*), sandwich tern (*S. sandvicensis*), and common tern (*S. hirunda*), as well as the black skimmer (*Rynchops niger*) during 1993 (Parnell et al. 1995). The number of nests for these five species were 26, 1,401, 253, 253, and 309, respectively (Parnell et al. 1995).

Another undiked, dredged material island in the sound landward from the southern end of Bodie Island, DR-005-06, had nests of nine species during 1993 (Parnell et al. 1995). These were the great [common, American] egret (*Casmerodius albus*), snowy egret (*Egretta thula*), little blue heron (*Florida caerulea*), tricolored [Louisiana] heron (*Hydranassa tricolor*), cattle egret (*Bubulcus ibis*), black-crowned night heron (*Nycticorax nycticorax*), yellow-crowned night heron (*Nyctanassa violacea*), white ibis (*Eudocimus albus*), and glossy ibis (*Plegadis falcinellus*). The number of nests per species ranged from one to 85.

Other species which nested on dredge disposal islands in Pamlico Sound during 1993 included the herring gull (*Larus argentatus*), great black-backed gull (*L. marinus*), Caspian tern (*Sterna caspia*), and brown pelican (Parnell et al. 1995).

Table 2. Colonial waterbirds of the Cape Hatteras National Seashore. List based on Fussell and Lyons (1990). Notes on nesting and seasonal abundance are based on data given by CZR Inc. (1992a). Seasons are Sp (Spring: March-May), Sum (Summer: June-August), Fall (September-November), and Win (Winter: December-February). Abundance is given as abundant (a), common (c), uncommon (u), occasional (o), rare (r), or accidental (-).

Common Name	Scientific Name	Notes	Notes/Abundance			
			Abundance			
			Sp	Sum	Fall	Win
Brown Pelican	<i>Pelecanus occidentalis</i>	a	c	c	c	u
Double-crested Cormorant	<i>Phalacrocorax auritus</i>		a	r	c	c
Great Blue Heron	<i>Ardea herodias</i>		u	u	u	u
Great (Common) Egret	<i>Casmerodius albus</i>	a	c	c	c	c
Snowy Egret	<i>Egretta thula</i>	nest	c	c	c	u
Little Blue Heron	<i>Egretta caerulea</i>	nest	c	c	c	u
Tri-colored Heron	<i>Egretta tricolor</i>	nest	c	c	c	u
Cattle Egret	<i>Bubulcus ibis</i>	nest	u	c	c	r
Green (-backed) Heron	<i>Butorides striatus</i>	nest	u	u	u	o
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	nest	c	c	c	u
Yellow-crowned Night Heron	<i>Nyctanassa violacea</i>	nest	r	u	u	r
White Ibis	<i>Eudocimus albus</i>	nest	-	o	o	r
Glossy Ibis	<i>Plegadis falcinellus</i>	nest	c	c	c	r
Laughing Gull	<i>Larus atricilla</i>	nest	a	a	a	u
Herring Gull	<i>Larus argentatus</i>	nest	a	c	a	a
Great Black-backed Gull	<i>Larus marinus</i>	nest	c	c	c	a
Gull-billed Tern	<i>Sterna nilotica</i>	nest	c	c	u	-
Caspian Tern	<i>Sterna caspia</i>	nest	u	u	c	o
Royal Tern	<i>Sterna maxima</i>	nest	c	c	c	u
Sandwich Tern	<i>Sterna sandvicensis</i>	nest	c	c	c	-
Common Tern	<i>Sterna hirunda</i>	nest	c	c	c	r
Forster's Tern	<i>Sterna forsteri</i>		a	c	r	a
Least Tern	<i>Sterna antillarum</i>	nest	c	c	c	-
Black Skimmer	<i>Rynchops niger</i>	nest	c	c	c	u

a Parnell et al. (1995) report nesting by this species near Oregon Inlet

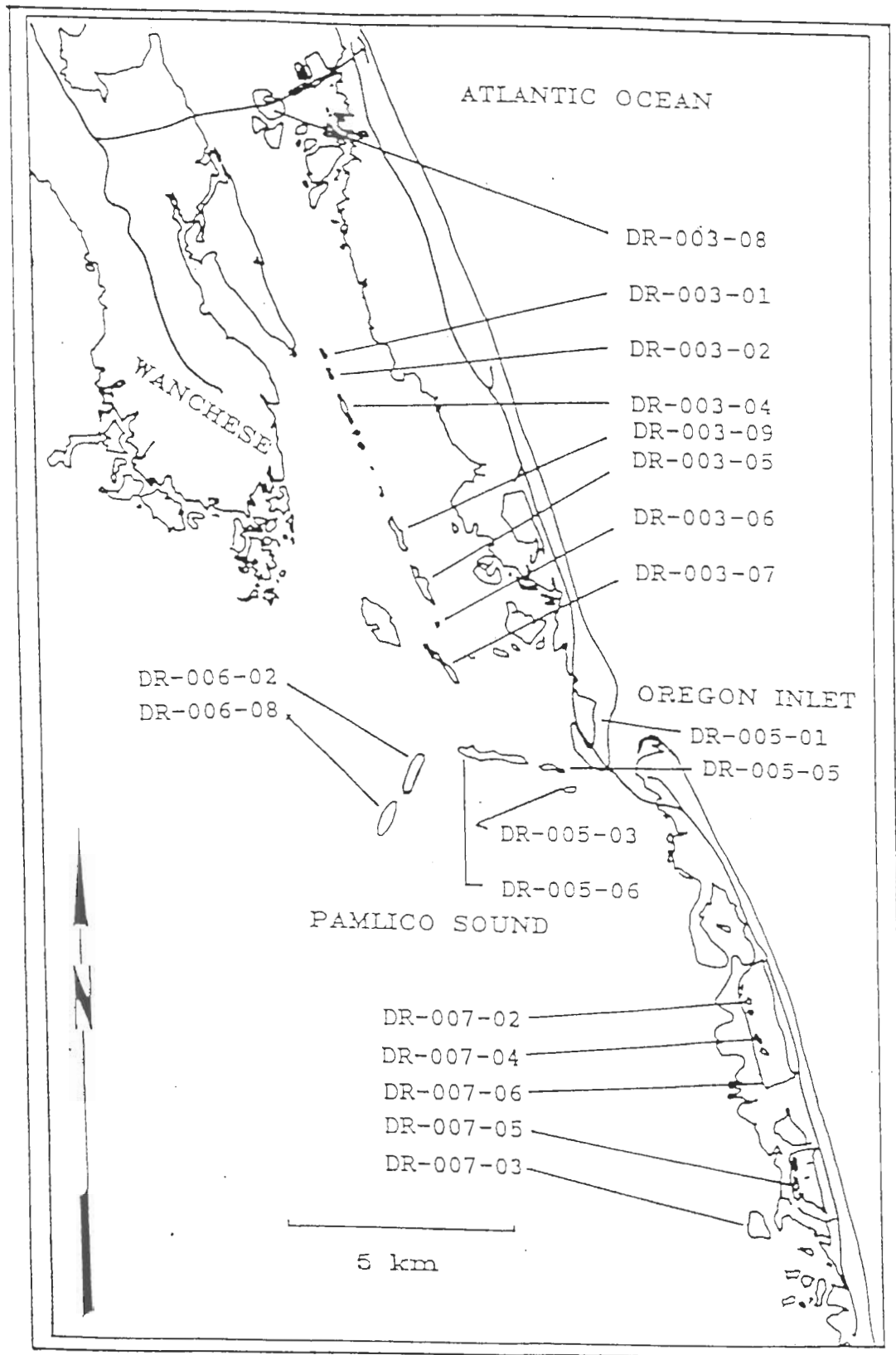


Figure 5. General location of nesting areas for colonial nesting waterbirds in the vicinity of the Walter Slough project, Dare County, North Carolina. DR indicates a site in Dare County. Some locations are artificial, dredge disposal islands. Sites, such as DR-005-06 and DR-003-07, near Walter Slough have been designated as Disposal Island C and D, respectively, and may be used for material removed during this project. Source: Parnell and Shields 1990.

Federally Protected Species

West Indian manatee

The West Indian manatee (*Trichechus manatus*), also known as the Florida manatee, is a federally endangered mammal. In the United States the species occurs primarily in Florida. Generally, manatees remain in the coastal waters of the Florida peninsula during the winter and disperse during summer months. Individuals may move north along the Atlantic Coast and occasionally make their way into the coastal waters of North Carolina (Webster et al. 1985).

Schwartz (1995) summarized manatee sightings in North Carolina from 1919 through 1994. This report provides information on the occurrence of 68 manatees from 59 sites. The species has been recorded in 11 coastal counties of North Carolina, including nine reports from Dare County. Four North Carolina records have been from inlet-ocean sites and six occurred in the open ocean. Open ocean reports include single sightings off Avon and Kitty Hawk, both in Dare County. Manatees have been reported in the state during nine months, with most sightings in the August-September period. Within Dare County manatees have been reported from Pamlico Sound (June 1975, September 1983, October 1983), Albemarle Sound (September 1983, October 1983), Collington Bay near Kitty Hawk (September-October 1986), Wanchese Harbor (September 1983), and the vicinity of Rodanthe (September 1987) (Schwartz 1995).

Manatees are strictly herbivorous and in the sound they are likely to feed on a wide variety of aquatic plants, including SAV. The presence of adequate food resources would be important in ensuring that migrating animals are able to return to warmer waters before the onset of winter.

Sea turtles

All five Atlantic sea turtles are protected by the Endangered Species Act and may occur in the coastal waters of North Carolina (Epperly et al. 1995). These species are the federally threatened loggerhead sea turtle (*Caretta caretta*), the federally threatened green sea turtle (*Chelonia mydas*), the federally endangered Kemp's ridley sea turtle (*Lepidochelys kempi*), the federally endangered hawksbill sea turtle (*Eretmochelys imbricata*), and federally endangered leatherback sea turtle (*Dermochelys coriacea*).

The presence of sea turtles in nearshore and estuarine waters of North Carolina appears to be seasonal. Sea turtles are present in the offshore waters of North Carolina throughout the year and present in inshore waters from April through December (Epperly et al. 1995). As waters cool in the fall, turtles emigrate from inshore waters of temperate latitudes and migrate southward. As waters warm in the spring, immature turtles migrate inshore and northward, repopulating the inshore waters. Such an inshore-offshore, seasonal migration may mean that several species of sea turtle may pass through Outer Banks inlets on a seasonal basis.

Survey data from North Carolina and other areas suggest that temperate and subtropical waters are important as developmental habitats for immature Kemp's ridley, green, and loggerhead sea turtles (Epperly et al. 1995). Post-pelagic juvenile green and loggerhead turtles appear to recruit to estuaries along the Atlantic coast.

The leatherback is not common in North Carolina waters. Leatherbacks occur along the entire coast of the state (Palmer and Braswell 1995, p. 41). About 40 individuals were reported from state waters and beaches between 1968 and 1980. Most leatherbacks were reported in the ocean, usually in relatively shallow water over the continental shelf, but away from beaches. Most records are from mid-April to mid-October. One leatherback was captured in Pamlico Sound during a 1989-1992 survey (Epperly et al. 1995).

The hawksbill is primarily tropical and not abundant in North Carolina waters. Hawksbills are omnivorous with the young apparently more herbivorous than the adults. One hawksbill was captured in Pamlico Sound during a 1989-1992 survey (Epperly et al. 1995).

The Kemp's ridley probably ranges along the entire coast of the state, but it is not common. The species is generally considered the most endangered sea turtle in the world (Palmer and Braswell 1995, p. 34). Most individuals have been reported in shallow water of high salinity areas of sounds near the sea. The species feeds mainly on clams, crabs, and snails.

Adult green sea turtles are mainly tropical and are only occasionally found in state waters, but immature greens are still relatively common along the North Carolina coast (Palmer and Braswell 1995, p. 30).

The loggerhead sea turtle is the most common sea turtle along the North Carolina coast. Loggerheads occur in the ocean and various estuarine environments. However, they may survive for extended periods in freshwater.

Shortnose Sturgeon

This species is federally listed as endangered. Adult sturgeons spend much of their life in estuaries and the ocean except during the spawning season, February to May, when they migrate to freshwater (Rohde et al. 1994, p. 61-62). The species and the Atlantic sturgeon are bottom dwellers that prefer deep water with a soft substrate. These species feed on worms, crustaceans, insect larvae, small clams, and small fish (Rohde et al. 1994, p. 62).

SECTION 6. FUTURE FISH AND WILDLIFE RESOURCES WITHOUT PROJECT

This section presents the opinion of the Service on the condition of fish and wildlife resources in the project area which could be reasonably anticipated in the absence of Corps' dredging of Walter Slough.

General Influences on All Fish and Wildlife Resources

The most important factor influencing all natural resources in the project area is the presence of the CHNS under the management of the NPS. This agency of the Department of the Interior (DOI) has a mission to conserve and protect all natural resources. The fact that much of project area is under the jurisdiction of this agency precludes many of the concerns about future habitat alterations and development that would occur if the project were on private land.

However, public lands are not immune from adverse environmental conditions occurring outside their borders. Future abundance and diversity of the study area's fish and wildlife resources will be largely determined by management activities of federal, state, county, and local regulatory agencies within the larger area of the Outer Banks. Actions which might adversely affect fish and wildlife resources include: (1) the conversion of wetlands for commercial and residential development; and, (2) a reduction in water quality due to the introduction of pollutants through numerous sources, including such nonpoint sources as urban run-off and septic tank failure.

Fish and wildlife resources are influenced by increased development for residential and commercial purposes adjacent to DOI land. If local authorities do not maintain strict enforcement of water quality standards, increased development could lower water quality. Furthermore, increased demand for water and pumping from ground water resources may influence aquatic habitats (Frankenberg 1995, pp 127-136).

Without the proposed project, the exact magnitude and time schedule of future dredging are unclear. If other interests attempted to maintain the channel with a sidecast dredge, the adverse impacts resulting from increased turbidity would be much greater. However, a limitation of Corps funds could severely reduce future dredging. A significant reduction in future dredging could lead to filling of the existing channel which is likely to enhance benthic invertebrate populations.

Outlook for Classes of Vertebrates

The general outlook for terrestrial amphibians, reptiles, and mammals is a continuation of present conditions for the foreseeable future. The various habitats for terrestrial birds in the barrier island uplands seem relatively secure within the national seashore.

Future fish populations within Pamlico Sound will be primarily dependent on changes in water quality and the enforcement of sustainable harvest quotas for commercial fishermen. Assuming that water quality conditions do not deteriorate significantly and that scientifically based harvests are maintained, both finfish and shellfish populations should not change dramatically in the foreseeable future.

The habitat protection provided by the NPS and the regulatory protection of many environmental factors within the project area are beneficial to the fish and wildlife resources. There are no

reasons to conclude that any species is currently facing an irreversible, population decline such that the impacts of proposed dredging and disposal would be irrelevant. Therefore, all adverse impacts of the proposed project must be fully considered.

Federally Protected Species

The outlook for manatees is primarily dependent on the conservation of habitat in the species' wintering areas in Florida. At the present time major efforts are being directed toward stabilizing and increasing the number of manatees, and the future of the species may be viewed with guarded optimism.

The outlook for all sea turtles is dependent on the success of ongoing conservation efforts. These measures include the protection of nesting beaches and special devices in fishing nets that exclude sea turtles. Within a time frame of several decades, the survival of sea turtles may also be viewed with guarded optimism. However, continued beach development and opposition to turtle excluding devices makes definitive statements about the survival of these species impossible.

As with all anadromous fish, the future of the shortnose sturgeon will depend on water quality and the ability to move freely between the ocean and freshwater spawning areas. Regulations must also be developed and enforced to ensure that the species is not harmed by fishing efforts directed at other species. Water quality must be maintained at freshwater spawning areas. While the long-term outlook for this endangered species is difficult to predict, every effort should be made to prevent adverse impacts to the species.

SECTION 7. ALTERNATIVES CONSIDERED

The DDPR discusses plan formulation for Walter Slough (USACOE 1999, pp. 4-6). This discussions the shoaling problem, the environmental conditions of the area, the controlling depth, and the commercial charter boats that uses the slough. The design vessel for the project, the largest boat expected to use the channel, is a 65-foot head boat with a draft of 4.5 feet. The most important project features are:

1. Alignment of proposed channel, including wideners at bends;
2. Dimensions (width and depth) of the channel;
3. Type of dredge: sidecast vs. hydraulic pipeline;
4. Location of disposal area;
5. Route of sediment transport to the disposal area(s); and,

6. Time of year for dredging and disposal

The proposed navigation channel is most likely to follow the alignment of the existing channel. However, the possibility of minor modifications exists. The desired dimensions of the channel dictate the amount of material to be moved. The Corps 1990 plan called for a channel 70 feet wide by 8 feet deep at MLW. Preliminary Corps plans call for a channel with a bottom width of 60 feet and a depth of 9 feet (7 feet of authorized depth plus 2 feet of overdepth). The current plan would remove an estimated 80,000 cubic yards of sediment. Preliminary coordination with the Corps indicates that channel dimensions are subject to changes. However, the factors that could lead to such changes are not presented and there are no indications of whether channel dimensions are more likely to be enlarged or reduced.

The type of dredging equipment has a significant influence on the generation of suspended solids. The two major alternatives are a sidecast dredge or hydraulic pipeline dredge. Corps considerations for dredging Walter Slough in both the 1990 and 1996 called for sidecast dredging. Presumably these two options were considered in recent planning.

The alternatives for dredge disposal are dependent on the type of dredge used. With sidecast dredging the material is merely move to the area immediately adjacent to channel. With a hydraulic pipeline dredge the material may be moved to an off site disposal area.

In theory, the proposed project could be scheduled at any time during the year. However, constraints of the federal appropriation cycle and contracting procedures may favor certain times of the year.

SECTION 8. SELECTION OF PREFERRED ALTERNATIVE

The DDPR discusses the evaluation of alternatives (USACOE 1999, pp. 9-16). The major planning goal was to optimize the channel dimensions of Walter Slough. The selection of channel alignment was probably based on the existing channel. Any changes in the existing alignment would seek to improve the efficiency of access between the OIFC and Oregon Inlet to Manteo Channel. Final channel dimensions were based on consideration of the size of the boats using the channel, the anticipated shoaling rate, and costs associated with creating and maintaining a channel of given dimensions.

The selection of dredging equipment is based on a consideration of: (1) the amount of material to be moved; (2) cost; and, (3) potential adverse environmental impacts. In both 1990 and 1996 resource agencies expressed concern about the use of a sidecast dredge. Environmental concerns strongly favor the use of a hydraulic dredge.

The route of sediment movement will depend on the choice of the disposal site and cost is expected to be an important factor in the final decision. Other factors which should be considered are potential harm to areas of SAV and estuarine, emergent wetlands.

There is probably no single time of year that would avoid adverse impacts to all fish and wildlife resources in the area. The final selection of the period for dredging and disposal will need to balance such diverse considerations as: (1) the nesting season of colonial waterbirds; (2) the annual movements of anadromous fish; (3) human visitation to the national seashore; (4) equipment availability; and, (5) the likelihood to major storms.

SECTION 9. DESCRIPTION OF PREFERRED ALTERNATIVE

The alternative preferred by the Corps was described in the DDPR (USACOE 1999, pp. 17-18). The plan includes:

1. The channel would be approximately 1.5 miles long and follow the alignment of the existing channel;
2. The channel would have a bottom width of 60 feet and a total depth of 9 feet at MLW (7 feet of authorized depth with 2 feet of overdepth). Side slopes would be 3:1. The project is estimated to require the removal of 84,000 cubic yards of sediment;
3. Dredging would employ a hydraulic pipeline dredge;
4. Dredging would be scheduled to occur between October 1 and March 31 to avoid adverse impacts to colonial nesting waterbirds. With a 12-inch hydraulic pipeline dredge, the construction period is likely to occur between January 1 and March 31 (USACOE 1999, p. 17).
5. Disposal of dredged material would be on Island D (Figure 3), an existing dredged disposal island in Pamlico Sound just west of the confluence of Walter Slough and the Oregon Inlet to Manteo Channel.
6. Maintenance dredging is expected to occur every four years and require the removal of 50,000 cubic yards of material. During the 50-year project life, approximately 600,000 cubic yards of material may be moved.

SECTION 10. IMPACTS OF THE PREFERRED ALTERNATIVE

The project would produce a direct loss of unvegetated, estuarine bottoms in the path of the proposed channel. Benthic fauna dredged from the channel would be lost. Dredging would also increase the depth of unvegetated bottoms. The greater depth would reduce the amount of sunlight reaching the bottom and alter other physical parameters of the habitat. Greater depth also reduces the habitat value of these bottoms for larval fish and shellfish by allowing access for larger predators (North Carolina Sea Grant Program 1996).

The project has the potential to directly eliminate areas of SAV. While past dredging may have prevented the establishment of SAV in the existing channel, areas which have not been recently dredged or small areas where the new channel may differ from the existing alignment, e.g., widenings at bends, may contain SAV. Any SAV in the path of the proposed channel, including the side slopes would be destroyed during construction.

The project may also diminish the long-term viability of nearby SAV by altering natural currents and other physical characteristics of the area. The important ecological functions provided by areas of SAV are dependent on the physical and biological characteristics of surrounding areas (North Carolina Sea Grant Program 1996). Flow patterns or currents in shallow, sandy areas facilitate the passive colonization of SAV by larval organisms. Areas of shallow sand and the flow characteristics of the areas are required for the proper functioning of seagrass meadows.

Initial construction and periodic maintenance would increase the amount of suspended solids in the water column. Turbidity resulting from increased suspended solids reduces the penetration of sunlight necessary for photosynthesis by aquatic vegetation, both rooted and planktonic. Furthermore, suspended solids may drift out of the immediate project area and settle on nearby SAV. Suspended solid which settle on SAV may bury the plants entirely or block sunlight needed for normal growth. High levels of suspended solids also harm benthic fauna by disturbing food intake by filter feeders and smothering sedentary organisms. Increased settling of suspended solids can also bury fish eggs and make them nonviable. Reduced light penetration can isolate thermal heating to the upper layers of the water column, sometimes exacerbating stratification and the associated depletion of oxygen in bottom waters and harm fish that occupy these waters (North Carolina Sea Grant Program 1996).

Project dredging may also release contaminants held within the sediment into the water column. Any contaminants would also be transferred to the disposal site(s). Harmful substances include toxic metals, organohalogen compounds, and pesticides. During resuspension toxic substances may become adsorbed to small particles of clay or organic matter. These particles may be ingested by filter feeders and enter the food chain (LaSalle 1986). Dredging during periods of oyster harvest may result in increased levels of silt and other suspended materials such as bacteria and pollutants in these animals. The release of harmful substance may adversely affect: (1) fish eggs, larvae, and juveniles; (2) eggs and larvae of shellfish; (3) shellfish beds; (4) benthic invertebrates; (5) anadromous fish; and, (6) seagrass beds (Lasalle 1986). At the selected disposal site(s), terrestrial vertebrates, primarily birds, would also be exposed to any toxic substances contained in the dredge material.

A hydraulic pipeline would be placed on the estuary bottom between the dredge and the disposal island. Depending on the path of the hydraulic pipeline, benthic communities and SAV may be destroyed. The physical presence of the pipeline through areas of SAV may destroy the plants covered by the pipeline. When the pipeline is removed the area of dead plants would be subject to erosion that would further diminish the areal extent of SAV.

Removal of previously undisturbed bottoms, whether vegetated or unvegetated, could adversely impact primary nursery areas (PNA) for fish. The Corps indicated that there are State-designated PNAs within the immediate vicinity of the existing project channel (USACOE 1999, p. EA-7). The increased turbidity and siltation associated with initial construction and maintenance could harm young fish in any nearby PNA.

While disposal on established spoil islands may benefit some colonial waterbirds, some species may lose nesting habitat. Spoil placement on a disposal island would, by definition, set back the existing successional stage to bare sand. While this would benefit pioneer species, such as royal and sandwich terns, other species which require some degree of vegetation would be harmed (Table 3).

Sediment disposal during the nesting season would be extremely harmful to colonial waterbirds. The critical time period for nesting by colonial water birds is April 1 through August 31 (unpublished report of the Interagency Season Work Group on Seasonal Dredging Period, Wilmington District, U. S. Army Corps of Engineers, August 1996). Sediment disposal during this period could result in direct destruction of the eggs and cause the abandonment of nests.

SECTION 11. COMPARISON OF IMPACTS

There are essentially three alternatives for the Walter Slough Navigation Channel. These are: (1) a do-nothing option; (2) a continuation of sidecast dredging; and (3) the current proposal for hydraulic pipeline dredging with disposal on existing spoil islands. The least environmental damaging alternative would be the do-nothing alternative. However, this option would not provide safe and reliable access for boats that must navigate the channel. If maintenance of the channel is economically justified, the two major features requiring comparison are the type of dredging equipment and the selection of a disposal site. Other features associated with channel maintenance, such as channel dimensions, possible contaminants, and work scheduling are not associated with a specific, action alternative.

The Service has opposed the use of sidecast dredges in the area. While such dredges avoid the problems associated with sediment transport and impacts at the disposal site, the high levels of suspended solids produced by sidecasting are considered unacceptable. The current proposal for using a hydraulic pipeline dredge represents a middle ground which provides for navigation and avoids the most significant problems associated with sidecast dredging.

While spoil island disposal also presents some negative elements, such as temporary increases in turbidity in the sound, there is the potential for benefits to colonial nesting waterbirds. As beach development on private property continues on the Outer Banks and the incidence of island overwash decreases due to the maintenance of artificial dunes, the amount of undeveloped areas of early successional, sandy substrate decreases. Therefore, areas of bare sand, whether natural or man-made, become increasingly important for colonial nesting waterbirds. Overall, the long-

Table 3. The major management groups for colonial nesting waterbirds in North Carolina. Data indicate the preferred nesting habitat for the species and the approximately duration of each habitat type as normal plant succession proceeds. Source: Parnell and Shields (1990).

Management Group	Primary Species	Secondary Species*	Typical nesting Habitat	Estimated use of a given site in years**
1	Royal Tern Sandwich Tern	Caspian Tern Least Tern Black Skimmer	Bare sand to sparse forbs	4
2	Least Tern	Common Tern Gull-billed T. Black Skimmer	Bare sand and shell to sparse forbs	4
3	Common Tern Gull-billed T. Black Skimmer	Least Tern Forster's T.	Bare sand and shell to moderate forbs	4-7
4	Brown Pelican Laughing Gull	Common Tern Gull-billed T. Herring Gull Great Black-backed Gull	Moderate to dense grasses and forbs	10
5	Forster's Tern	Common Tern	Drift material on moderate to dense grasses and forbs	Unpredictable
6	Herring Gull Great Black-backed Gull	Laughing Gull	Sparse to dense grasses and forbs	5
7	Great Egret Snowy Egret Little Blue Heron Tricolored Heron Cattle Egret Green-b. Heron Black-c. Night-H. Yellow-c. Night-H. White Ibis Glossy Ibis		Shrub thickets to maritime forests (occasionally in dense grasses and forbs)	30+
8	Great Blue Heron Great Egret Anhinga Double-c. Cormorant	Green-b. Heron Yellow-c. N.-H.	Swamp forests	30+

* Management for the primary species may also produce conditions suitable for the secondary species.

** Length of time from first appearance of the appropriate habitat until vegetation succession makes a site unsuitable for the species.

term benefits associated with the creation of non-toxic nesting areas on existing spoil islands seem to outweigh the short-term environment harm.

The use of an upland, diked disposal area creates the possibility of short-term turbidity in nearby waters. However, there are not likely to be significant, long-term, adverse impacts.

SECTION 12. FISH AND WILDLIFE CONSERVATION MEASURES

Fish and wildlife conservation measures, as specified in the FWCA, consist of "...means and measures that should be adopted to prevent the loss of or damage to such wildlife resources (mitigation), as well as to provide concurrently for the development and improvement of such resources (enhancement)." Mitigation, as defined by the Council on Environmental Quality and adopted by the Service in its mitigation policy, includes:

1. avoiding the impact altogether by not taking a certain action or parts of an action;
2. minimizing impacts by limiting the degree or magnitude of the action and its implementation;
3. rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
4. reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and,
5. compensating for the impact by replacing or providing substitute resources or environments.

These five actions should be viewed as the proper sequence for formulating conservation measures.

Enhancement measures are those which result in a net increase in resource values under the with-project condition compared to the without-project condition. The creation of early successional nesting habitat for colonial waterbirds would be a form of enhancement. For any given type, kind, or category of resource being evaluated, there must be compensation (i.e., full replacement) for all project-associated losses before any enhancement of that given resource can occur.

General Conservation Measures

Overall, the Service believes that the goals of this project can be achieved with a minimum of short-term, adverse impacts and negligible, adverse, long-term, environmental consequences. However, this optimistic outlook is predicated on a sufficient amount of pre-project planning and the financial resources to balance project goals with environmental protection. The valuable resources of Pamlico Sound and the Outer Banks will not be well served if cost becomes the

overriding consideration in the selection of design features and construction techniques. In order to fulfill the Service's obligations under the FWCA, we offer the following conservation measures for the project.

Project planning should seek to minimize the direct loss and indirect impacts on all estuarine habitats. The loss of shallow, unvegetated benthic habitat would be minimized by keeping the dimensions of the channel, both width and depth, as small as possible. Considering the 3:1 side slopes along the entire channel of 1.5 miles, a small increase in depth would produce considerable loss of estuarine bottoms.

Significant benefits to fish and wildlife resources would also result from avoiding any direct loss or indirect harm to SAV and/or PNAs. The Corps should use the latest, available data to determine whether SAV occurs in the actual path of the navigation channel. The DDPR notes (USACOE 1999, p. 19) that plan implementation will involve hydrographic and topographic surveys of the channel. These surveys should determine the extent of SAV, if any, that would be impacted. If SAV does occur in existing path, the Corps should attempt to create an alignment which would avoid direct impacts to SAV. Project planning should also follow guidelines of the North Carolina Sea Grant Program (1996) which state:

"Protection of seagrass beds should extend 10 meters [33 feet] from the edge of the bed. No direct disturbances should occur to the bed or to this surrounding shallow sand area."

The potential loss of SAV would also be minimized by keeping the width and depth of the channel as small as possible.

Every effort should be made to minimize turbidity associated with the actual dredging, transport to the disposal site, and disposal. While a hydraulic pipeline dredge would produce less turbidity than a sidecast dredge, procedures must be in place to prevent leakage from pipelines. Such leakage would increase turbidity and could result in the burial of SAV and estuarine, emergent wetlands.

The placement of the hydraulic pipeline through areas of SAV would destroy plants and open up a path for erosion to remove the substrate required by nearby plants. Therefore, an important conservation measure would be to route the pipeline along unvegetated, estuarine bottoms. The pipeline may also be floated along the surface of the sound to avoid harm to estuarine bottoms.

Regardless of whether the hydraulic pipeline is floated or placed on the estuary bottom, emergent wetlands may be encountered as the pipeline moves into shallow water en route to either the beach, disposal island, or mainland disposal site. The most effective conservation measure to protect emergent wetlands would be to route pipelines away from these areas. If pipelines must cross emergent wetlands, mats should be placed under the pipeline to minimize harm.

Significant environmental impacts can be avoided by ensuring that the sediment is free of toxic substances. The Corps should ensure that the material removed from the channel would not be toxic to organisms which would inhabit the disposal areas. The best methods to ensure contaminant-free sediment would be laboratory testing of samples for the most likely toxic substances, such as pesticides and petroleum products.

Disposal on Island D has the potential to benefit nesting by colonial waterbirds that use early successional habitat. However, there should be planning and coordination with state, non-game biologists to ensure the maximum benefit from spoil island disposal. Disposal must not occur during the nesting season, generally from April 1 through August 31. Disposal should not eliminate mid- to late- successional nesting areas if such areas are in short supply. As with the consideration of other resources, the sediment should be free of any toxic compounds.

Compensatory Mitigation

While avoiding any losses of SAV or emergent wetlands is the best conservation measure for maintaining fish and wildlife habitat, some unavoidable losses may occur. If either submerged or emergent wetlands are destroyed, the Corps should develop and implement a plan of compensatory mitigation. The primary goal of this plan should be the creation or restoration of identical wetlands (in-kind) located in the immediate vicinity of the areas lost (on-site). The plan should ensure that there is no net loss of the habitat values provided by vegetated, estuarine wetlands.

SECTION 13. RECOMMENDATIONS

The Service provides the following recommendations for incorporation into plans for the Walter Slough project:

1. The navigation channel should have the minimal width and depth necessary to achieve project goals in order to minimize the loss of unvegetated, estuarine bottoms and SAV. The Service recommends that a 60-foot width and 7-foot depth, plus 2 feet of overdepth, be considered maximum dimensions for the channel.
2. The Corps should ensure that dredging does not remove areas of SAV. All areas of the channel produced by the project should be essentially free of rooted, aquatic plants. Furthermore, the proposed channel, including side slopes should be at least 33 feet (10 meters) from any SAV.
3. Project plans should clearly specify State-designated Primary Nursery Areas and indicate measures taken to prevent any long-term degradation of these sites.
4. Dredging procedures should employ equipment which avoids or minimizes a significant increase in suspended solids in or near the dredge site. These procedures should include

safeguards to ensure that leaks from the pipeline do not harm SAV or emergent wetlands around the disposal island. Accidental sediment spills or filling of vegetated wetlands, open water, and vegetated uplands should be immediately corrected by restoring the affected area to its original contour.

5. If the hydraulic pipeline is placed on the bottom of the sound, the pipeline should not be placed on SAV.
6. The path of the hydraulic pipeline should avoid harm to areas of estuarine, emergent wetlands, e.g. *Spartina* marsh. With the exception of small (100 square feet or less) wetland crossings, mats should be placed on the surface of emergent wetlands along the pipeline route to minimize damage to wetland vegetation.
7. There should be clear and compelling evidence that the project would not introduce any toxic substances into the disposal area. The consideration of toxic substances should involve more than a professional opinion that harmful compounds are not likely to be present. Laboratory analyses of sediment samples would provide the best data on the degree to which the sediment removed would impact organisms in the disposal area.
8. Sediment placement on established disposal islands in Pamlico Sound would enhance nesting habitat for colonial waterbirds nesting in early successional areas (bare sand), but may eliminate nesting habitat for species using areas in a later successional stage. The use of existing disposal islands should be carefully coordinated with state non-game biologists to ensure that the nesting habitat created has a high probability of use by early successional nesters and that there is an adequate amount of any mid- to late successional nesting habitat which would be eliminated by the project.
9. If dredging produces permanent damage to areas of SAV or emergent wetlands, the Corps should develop and implement a compensatory mitigation plan that results in no net loss of these valuable habitats.

The Service believes that the incorporation of these recommendations would result in a navigation channel which meets the stated goals of the project and produces minimal harm within the significant ecosystems of the project area. However, the Corps should not allow a consideration of costs to be the exclusive factor in deciding which recommendations will become part of the final plan. Therefore, the Service encourages the Corps to carefully balance the long-term benefits associated with each of the recommendations given above against the added costs which they may require.

SECTION 14. SUMMARY OF FINDINGS AND SERVICE POSITION

Findings of the Service

The Service recognizes the need to ensure safe, reliable passage through Walter Slough. This goal can be achieved by maintaining the existing channel. With careful planning project goals can be achieved with only minor short-term, adverse environmental impacts and negligible long-term impacts. However, the Corps and local interests should not expect the environmental safeguards recommended by the Service to be cost neutral, i.e., there are additional costs associated with avoiding and minimizing environmental impacts.

The Service believes that sufficient environmental information is available, or could be obtained, to fully describe the natural resources at risk with the proposed project and development practical recommendations to protect the fish and wildlife resources of the area. The only critical issue is the degree to which the Corps will balance the clearly defined costs of implementing the Service's recommendations against the habitat values that would be retained by full implementation, but which cannot be clearly defined in terms of financial benefits to the project area.

Position of the Service

The position of the Service is that there is a justifiable need to maintain safe and reliable passage through Walter Slough and the overall purpose of the current proposal addresses that need. The previous report (USFWS 1986) by the Service on the Walter Slough project noted:

"In describing the anticipated project impacts, we assume that our recommendations will be followed and that project design will incorporate safeguards which avoid significant adverse impacts and minimize unavoidable impacts. Without appropriate safeguards and mitigation, the work could have a significant long-term adverse impacts on the environment."

This statement remains the position of the Service. If the recommendations given in this report are fully implemented, project goals can be achieved without significant harm to the environment. If, on the other hand, the environmental protection inherent in our recommendations are rejected or scaled down in the name of economy, the fish and wildlife resources of the project area are very likely to be diminished.

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